# PROCEEDINGS

OF THE

# Seventeenth Annual Meeting

OF THE

# Florida

# State Horticultural Society

HELD AT

## Jacksonville, April 26, 27 and 28, 1904

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COMPILED BY THE SECRETARY

PUBLISHED BY THE SOCIETY

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1904

## CONSTITUTION.

ARTICLE 1. This organization shall be known as The Florida Horticultural Society, and its object shall be the advancement of horticulture.

ARTICLE 2. Any person may become a member of the Society by subscribing to the Constitution and paying one dollar. Any person may become a Life Member of the Society by subscribing to the Constitution and paying ten dollars.

ARTICLE 3. Its Officers shall consist of a President, three Vice Presidents, Secretary, Treasurer, and Executive Committee of three, who shall be elected by ballot at each annual meeting. After the first election, their term of office shall begin on the first day of January following their election.

ARTICLE 4. The regular annual meeting of this Society shall be held on the second Tuesday in April, except when otherwise ordered by the Executive Committee.

ARTICLE 5. The duties of the President, Vice-Presidents, Secretary and Treasurer shall be such as usually devolve on those officers. The President, Secretary and Treasurer shall be, ex-officio, advisory members of the Executive Committee.

ARTICLE 6. The Executive Committee shall have authority to act for the Society between annual meetings.

ARTICLE 7. The Constitution may be amended by a vote of two-thirds of the Members present.

## BY-LAWS.

1. The Society year shall be co-extensive with the calendar year, and the annual dues of Members shall be one dollar.

2. All bills authorized by the Society or its Executive Committee, for its legitimate expenses, shall be paid by the Secretary's draft on the Treasurer, O. K.'d by the President.

3. The meetings of the Society shall be devoted only to Horticultural topics from scientific and practical standpoints, and the Presiding Officer shall rule out of order all motions, resolutions and discussions tending to commit the Society to partisan politics or mercantile ventures.

# Florida State Horticultural Society.



***Officers Elect for 1904:***

PRESIDENT:

GEORGE L. TABER, Glen St. Mary.

VICE-PRESIDENTS:

Dr. GEORGE KERR, Pierson; G. W. WILSON, Jacksonville;
F. D. WAITE, Palmetto.

SECRETARY:

E. O. PAINTER, Jacksonville.

TREASURER:

W. S. HART, Hawks Park.

EXECUTIVE COMMITTEE:

LYMAN PHELPS, Chairman, Sanford; E. S. HUBBARD, Federal Point;
C. T. McCARTY, Eldred.

President, Secretary and Treasurer, ex-officio.

## STANDING COMMITTEES:



CITRUS FRUITS: E. S. Hubbard, Federal Point; E. P. Porcher, Cocoa; O. N. Conner, Tangerine.

DISEASES, INSECTS AND METHOD OF CONTROL: Prof. H. A. Gossard, Lake City; Arthur H. Brown, Manavista; John Fabyan, Leesburg; Joseph F. Corrigan, M. D., St Leo; John J. Beers, Emporia; A. B. Harrington, Winter Haven; Prof. P. H. Rolfs, Miami; The President and Secretary ex-officio members.

PEACHES, PLUMS AND PEARS: J. P. Mace, Lake Helen; C. L. Peek, Starke; H. F. Hole, Fulton.

GRAPES, FIGS AND KAKI: H. Von Luttichau, Earleton; J. H. Girardeau, Monticello; J. H. Wyley, Interlachen.

PINEAPPLES AND OTHER TROPICAL FRUITS: Mrs. E. E. Ankeney, Eldred; Henry Benedict, Orlando; C. B. Crockett, Jr., Cocoanut Grove.

ORNAMENTALS: Mrs. C. T. McCarty, Eldred; Mrs. P. H. Rolfs, Miami; G. A. Purdie, Ormond.

FERTILIZERS AND IRRIGATION: Dr. Richardson, Tampa; G. W. Leonard, Hastings; C. W. Butler, St. Petersburg.

NUT CULTURE: J. A. Bair, Palatka; D. J. Andrews, Chipley; John B. Curtis, Orange Heights.

TRANSPORTATION: F. A. Carroll, Jacksonville; W. D. Griffin, Jacksonville; Irving H. Welch, Jacksonville.

STRAWBERRIES AND MISCELLANEOUS: Dr. A. L. Scott, Starke; W. C. Steele, Switzerland; Prof. F. C. Reimer, Lake City.

VEGETABLES: C. G. White, Hastings; F. C. Armstrong, Terra Ceia; E. V. Blackman, Miami.

AD INTERIM COMMITTEE ON NEW FRUITS AND NOMENCLATURE: Prof. H. Harold Hume, Raleigh, N. C.; W. S. Hart, Hawks Park; E. N. Reasoner, Oneco.

LEGISLATION: W. M. Bennett, Okahumpka; Dr. Geo. Kerr, Pierson; M. E. Gillett, Tampa.

# LIST OF MEMBERS.

## HONORARY.

Berckmans, P. J., Augusta, Ga.
Flagler, H. M., Saint Augustine, Fla.
Redmond, D., Saint Nicholas, Fla.

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## LIFE.

Alderman, A. D., Bartow, Fla.
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Andrews, Clement W., John Crerar Library, Chicago, Ill.
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Kerr, Dr. Geo., Pierson, Fla.
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Loehr, F. C., Ft. Ogden, Fla.
McCarty, C. T., Eldred, Fla.
McCarty, Mrs. C. T., Eldred, Fla.
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Milligan, John W., Apopka, Fla.
Olsen, Olaf, White City.
Painter, E. O., Jacksonville, Fla.
Painter, Mrs. E. O. Jacksonville, Fla.
Phelps, Rev. Lyman, Sanford, Fla.
Pike, W. N., Floral Park, N. Y.
Racey, Chas. H., Waveland, Fla.
Robinson, M. F., Sanford, Fla.
Rolfs, Prof. P. H., Miami, Fla.
Sartorius, H. G., Seminole, Fla.
Smith, Chas. E., Bogwalk, Jamaica.
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White, C. G., Hastings, Fla.
Wilson, Lorenzo A., Jacksonville, Fla.
Woodroffe, Alfred, Auckland, New Zealand.
Worcester, C. H., Pomona, Fla.
Wyeth, J. H., Winter Park, Fla.

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**ANNUAL.**

Abdill, Mrs. L. A., Eldred, Fla.
Ackeson, Miss Rebecca P., Mt. Dora, Fla.
Adams, Geo. W., Thonotosassa, Fla.
Adams, J. Q., Geneva, Fla.
Adams, Mrs. Geo. W., Thonotosassa, Fla.
Adams, F. H., Dunedin, Fla.
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Ankeney, R. V., Ankona, Fla.
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Atwood, Abner, Thonotosassa, Fla.
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Holland, B. F., Bartow, Fla.
Holly, J. C., Deerfield, Fla.
Holly, Mrs. J. C., Deerfield, Fla.

Hopkins, Jno. L., Mount Airy, Ga.
Howard, Frank, Ludlow, Vt.
Howell, J. O., Oneco, Fla.
Hoxie, A. E., St. Petersburg, Fla.
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Hubbard, Robert J., Cazenovia, N. Y.
Hubbard, E. Stuart, Federal Point, Fla.
Hubard, Mrs. E. S., Federal Point, Fla.
Hudson, Mrs. F. N., Tibbals, Fla.
Hudson, J. W., Dade City, Fla.
Hume, Edward Grisdale, Raleigh, N. C., care Prof. H. Harold Hume.
Hume, Prof. H. Harold, Raleigh, N. C.
Hume, Mrs H. Harold, Raleigh, N. C.
Hunt, W. W., St. Petersburg, Fla.
Hunter, James, Stetson, Fla.
Hutchinson, John T., New Augustine, Fla.
Hutchinson, Mrs. John T., New Augustine, Fla.
Irvin, Allen, Roewell, New Mexico.
Jackson (?), Jacksonville, Fla.
Jackson, Gust, Piedmont, Fla.
Jackson, J. W., Palmetto, Fla.
Jacocks, Mrs. C. W., Formosa, Fla.
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Lake, Thomas A., Limona, Fla.
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Lamb, S. S., Jr., Palmetto, Fla.
Land, Asa, Palmetto, Fla.
Lane, A. F., Huntington, Fla.
Lane, J. A. P., Miami, Fla.
Lane, Jno. S., Eustis, Fla.
LaRoche, R. B., Courtenay, Fla.
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Leslie, James, Jacksonville, Fla.
LeTourneau, Mrs. J. H., Eden, Fla.
Lewis, W. J., Limona, Fla.
Lindsay, J. E., Davenport, Iowa.
Littlefield, S. C., Little River, Fla.
Littlefield, Mrs. S. C., Little River, Fla.
Loeser, Thos., Altoona, Fla.
Longley, N. H., Seminole, Fla.
Lubrecht, Herman, Island Grove, Fla.
Lucas, Geo. Loutrel, Constant Springs P. O., Jamaica, W. I.
Luttichau, Baron H. von, Earleton, Fla.
Lyman, A. E., Melbourne, Fla.
Lyman, F. W., Georgiana, Fla.
McBride, E. L., DeLand, Fla.
McClary, W. T., DeLand, Fla.
McDonald, A., Sanford, Fla.
McDonald, Joseph A., Miami, Fla.
McGinty, O. H., Braidentown, Fla.
McLean, J. N., Palmetto, Fla.

McMullen, Miss Lillian, Largo, Fla.
McMullen, M. J., Belleair, Fla.
McNeal, Chas. Mgr. McNeal Wharf, Braidentown, Fla.
Mace, J. P., Lake Helen, Fla.
Mace, Loring P., Lake Helen, Fla.
Mace, Miss Marjory, Lake Helen, Fla.
Magruder, H. J., Oak Hill, Fla.
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Meislahn, H., Clarcona, Fla.
Merrill, Dr. W. C., Palatka, Fla.
Miller, J. W., Crescent City, Fla.
Miller, L. B., Lady Lake, Fla.
Mills, C. D., Jacksonville, Fla.
Mitchell, Lee, Palmetto, Fla.
Moffitt, R., St. Petersburg, Fla.
More, Rt. Rev. Chas. H., Saint Leo, Fla.
Moore, J. S., Oviedo, Fla.
Moore, Mrs. Jessie S., Cocoanut Grove, Fla.
Moore, L. C., Roseland, Fla.
Moore, R. S., Naomie, Louisiana.
Moore, Capt. W. R., Geneva, Fla.
Morse, Frederick S., Miami, Fla.
Moses, Wallace R., West Palm Beach, Fla.
Motter, Mrs. G. W., West Palm Beach, Fla.
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Mowers, Mrs. W. H., DeLand, Fla.
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Nordman, Ferd., New Smyrna, Fla.
Nye, A. J., St. Petersburg, Fla.
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O'Brien, W. S., Thonotosassa, Fla.
Olsen, H. C., Stuart, Fla.
Osborn, Jas. M., Daytona, Fla.
Painter, Miss Okle, Jacksonville, Fla.
Palen, Peter E., Haines City, Fla.
Palmer, R. A., Braidentown, Fla.
Parker, Ed., Orlando, Fla.
Parmenter, M. E., Orange Park, Fla.
Pattillo, H. A., Sanford. Fla.
Peck, M. H., Daytona, Fla.
Peck, Mrs. M. H., Daytona, Fla.
Peek, C. L., Starke, Fla.
Perry D. W., Pomona, Fla.
Pettigrew, A. J., Manatee, Fla.
Pfyffer, John, Pulaski, Ind.
Phelps, Mrs. Lyman, Sanford, Fla.
Phillips, F. V., Winter Park, Fla.
Pierson, D. L., Monticello, Fla.
Pierson, Mrs. D. L., Monticello, Fla.
Player, Harry, care U. S. Engineer's office, Tampa, Fla.
Popple, W. S., Estero, Fla.
Porcher, E. P., Cocoa, Fla.
Porcher, Mrs. E. P., Cocoa, Fla.
Potter, G. W., West Palm Beach, Fla.
Pound, Orange, Box 204, Bartow, Fla.
Pratt, Dr. E. E., Limona, Fla.
Prevatt, A. B., Seville, Fla.
Pugsley, Chas., Interlachen, Fla.
Purdie, G. A., Ormond, Fla.
Purk, Hy., 4231 Virginia Ave., St. Louis, Mo.
Putney, E. D., Avon Park, Fla.
Pylant, J. B., Bartow, Fla.
Quay, R. R., St. Lucie, Fla.
Ragan, R. W., Banyan, Fla.
Ragan, W. J., Banyan, Fla.
Ramp, Geo. D., Bartow, Fla.
Ramsdell, Joseph, Lemon City, Fla.

Roberts, Mrs. M. B., Dade City, Fla.
Robinson, P. E., White City, Fla.
Robinson, W. E., Palmetto, Fla.
Roesch, Robt. H., Braidentown, Fla.
Rolfs, Mrs. P. H., Miami, Fla.
Rollins, C. A., Thonotosassa, Fla.
Rose, R. E., Tallahassee, Fla.
Rose, Mrs. R. E., Tallahassee, Fla.
Rowlet, Prof., Palmetto, Fla.
Ruppard, R. M., Leesburg, Fla.
Saeger, Arthur, Ankona, Fla.
Saeger, G. A., Ankona, Fla.
Saeger, Mrs. G. A., Ankona, Fla.
Sample, J. W., Bartow, Fla.
Sampson, F. G., Boardman, Fla.
Sams, H. H., Courtenay, Fla.
Sams, W. E., Courtenay, Fla.
Sanders, G. N., Jacksonville, Fla.
Sawrie, W. S., St. Petersburg, Fla.
Sawyer, L. J., Tibbals, Fla.
Schabinger, J. J., Delray, Fla.
Schaefer, J. V., 6630 Yale Ave., Chicago, Ill.
Schmelz, Victor, Sylvan Lake, Fla.
Scott, Dr. A. L., Starke, Fla.
Scruggs, S. M., South Jacksonville, Fla.
Sellmer, Chas., Zellwood, Fla.
Shepherd, S. P., Winter Park, Fla.
Shooter, C. C. Earlton, Fla.
Simmons, W. P., Jacksonville, Fla.
Simpson, H. T., Clearwater, Fla.
Snow, Geo. E., Eastlake, Fla.
Smith, W. E., Daytona, Fla.
Snyder, A. S., St. Petersburg, Fla.
Soar, J. J., Little River, Fla.
Soar, Stephen, Dade City, Fla.
Somerville, Hugh, Dunedin, Fla.
Rankin, W. H., Punta Gorda, Fla.
Rawlinson, W. C., Ankona, Fla.
Rawlinson, Mrs. W. C., Ankona, Fla.
Reasoner, E. N., Oneco, Fla.
Reasoner, Mrs. E. N., Oneco, Fla.
Rector, H. J., Florahome, Fla.
Reed, Geo. B., Little River, Fla.
Reed, J. E., Indianola, Fla.
Reilly, Jno. B., Miami, Fla.
Reimer, Prof. F. C., Lake City, Fla.
Richards, H. W., Stuart, Fla.
Richardson, C. O., Miami, Fla.
Richardson, J. T., Bartow, Fla.
Richardson, Dr. Wm. C., corner Hyde Park and Grand Central Avenue, Tampa, Fla.
Riggin, Geo., Braidentown, Fla.
Roberts, A., Dade City, Fla.
Spencer, H. E., 124 W. Main St., Tarrytown, N. Y.
Spencer, Thomas, 20 Manhattan Market, New York City, care of Kingan Provision Co.
Sperry, E. F., Orlando, Fla.
Springstead, I. E., Palmetto, Fla.
Stall, B. E., Magdalene, Fla.
Stanton, Rev. Wm. E., 612 Ave., C., Miami, Fla.
Steele, W. C., Switzerland, Fla.
Steinmetz, J. B., Clay Springs, Fla.
Sterling, Henry J., Delray, Fla.
Stevens, H. B., Stetson, Fla.
Stevens, J. A., Citra, Fla.
Stewart, I. A., DeLand, Fla.
Stone, L. L., Woodbridge, Fla.
Street, A. W., Ormond, Fla.
Strout, H. T., Fruitland Park, Fla.
Strunk, Wm. P., Box 401, Roodhouse, Ill.
Stryker, Thomas H., Rome, N. Y.
Stuart, E. C., Bartow, Fla.
Tallevast, J. Lyde, Manatee, Fla.
Tancre, Mrs. Jane A. W., Ankona, Fla
Tanner, L. C., Bartow, Fla.
Tarr, W. W., 146 State St., Chicago, Ill.
Tarter, C. R., Estero, Fla.
Tasker, R. C., Delary, Fla.
Tatum, B. B., Miami, Fla.
Taylor, Dr. J. N., Jacksonville, Fla.
Terrell, Chas. Mills, Miami, Fla.
Thomas, Robert, St. Petersburg, Fla.
Thompson, C. H., Winter Haven, Fla.
Thompson, J. O., Oneco, Fla.
Thornton, C. B., Orlando, Fla.
Tischler, P., Jacksonville, Fla.
Tison, Adam, Raiford, Fla.

Van Horne, W. C., Montreal, Canada.
VanWyck, Miss Mary, New Hamburg, New York.
Varn, W. B., Bartow, Fla.
Veillard, R., St. Petersburg, Fla.
Waddell, E. A., Miami, Fla.
Wade, B. F., Palmetto, Fla.
Waite, F. D., Palmetto, Fla.
Wakelin, Amos, Bullitt Bldg., Philadelphia, Penn.
Wakelin, Guilford M., Lane Park, Fla.
Wakelin, Miss Grace V., Lane Park, Fla.
Walker, Chas. H., Bartow, Fla.
Walker, Geo. E., Huntington, Fla.
Walker, Mrs. G. E., Huntington, Fla.
Wallace, George B., Braidentown, Fla.
Warner, S. C., Palatka, Fla.
Warnock, Wm. A., Oak Hill, Fla.
Warren, Dr. E. W., care State Board of Health, Jacksonville, Fla.
Watney, A. Percy, Fulton, Fla.
Watson, A. S., Braidentown, Fla.
Watts, B. F., Leesburg, Fla.
Tonner, W. E., 701 Market St., Steubenville, Ohio.
Townsend, C. Marot, 1108 Walnut St., Philadelphia.
Townsend, John H., Glen Saint Mary, Fla.
Travis, S. F., Cocoa, Fla.
Truby, J. M., Starke, Fla.
Tysen, C. R., Jacksonville, Fla.
Tysen, J. R., Jacksonville, Fla.
Upham, E. S., South Lake Weir, Fla.
VanDuzee, Col. C. A., 709 Ernest Bldg., St. Paul, Minn.
Webber, H. J.,Washington, D. C.
Weeks, Geo. M., Glen Saint Mary, Fla.
Weidman, Jacob, 319 Lexington Ave., Pittsburg, Penn.
Weiland, Chas., 2319 Indiana Ave., St. Louis, Mo.
Welsh, Irving H., 401-404 Law Exchange, Jacksonville, Fla.
Wells, Mrs. Mary, Burlington, Vt.
Wheeler, Abram, 703 May St., Jacksonville, Fla.
White, Miss L. M., Dupont, Fla.
Whitson, Wm., Table Rock, Neb.
Whitten, Wm. M., Punta Gorda, Fla.
Whittle, W. J., Largo, Fla.
Wiethuchter, Mrs. Theodore, Grant, Fla.
Wightmen, L., P. O. Box 206, Tampa, Fla.
Williams, J. E., Seabreeze, Fla.
Willis, Emmet C., Little River, Fla.
Willis, J. H., Palmetto, Fla.
Willis, R. F., Palmetto, Fla.
Wills, Francis L., Sutherland, Fla.
Wilson, Geo. W., Jacksonville, Fla.
Wilson, T. L., Bartow, Fla.
Wing, C. W., Bayard, Fla.
Witherington, H. H., Apopka, Fla.
Woodall, Henry, St. Petersburg, Fla.
Woodward, F. W., Eau Claire, Wis.
Woolwine, E. M., Seville, Fla.
Worcester, Mrs. C. H., Pomona, Fla.
Wyatt, J. B., Manatee, Fla.
Wyckoff, John S., Citra, Fla.
Wyeth, Mrs. J. H., Winter Park, Fla.
Wylie, J. H., Interlachen, Fla.
Yocum, Mrs. W. F., Lake City, Fla.

605 Members this year

# PROCEEDINGS

OF THE

## Seventeenth Annual Meeting

OF THE

# Florida State Horticultural Society.

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The seventeenth annual convention of the Florida State Horticultural Society was held in the Board of Trade rooms on the invitation of the Board of Trade and the citizens of Jacksonville, commencing at 8 o'clock, Tuesday evening, April 26, 1904.

The session was opened by prayer by Rev. Edwin G. Weed.

Capt. C. E. Garner, President of the Board of Trade, delivered the following:

### ADDRESS OF WELCOME.

*Mr. President, Ladies and Gentlemen:*

In the name of the Board of Trade, representative of the business interests of our City, it is my pleasure today to extend to the great Horticultural Society of the State of Florida a most sincere and hearty welcome. I want to say, however, that when this Society meets in this City and in these rooms, it is not necessary for me to extend to them an address of welcome. I want to say now, once and for all, that when the Florida Horticultural Society meets in this City that they are always welcome; no matter how many times they come here, they are always welcome. I want to say that this Society should go to such parts of the State that they deem it to their interest to go; go down the beautiful East Coast, if you desire to do so, go to Pensacola, Tampa or Miami, if you think it to your advantage, but I want you to always consider that this is your home and these are your headquarters and when the Society meets here it is not necessary that the head should be here to extend them a heartfelt welcome. We realize the splendid work that this Society has done for our State and our own organization is working in accordance with you. If you will notice, on coming into this building on the left hand side, there is an inscription that this Board of Trade and building is dedicated to the welfare of our State and City and I want to say to you that in my judgment no organization is more thoroughly in accord with our Board of Trade than is the Horticultural Society of the State of Florida in working for the upbuilding of our State.

We realize that cities can not be supported in a desert. We realize that cities must be supported outside of the city. We realize that everything that goes to the upbuilding of our State, turns to make us a larger and better Jacksonville.

Since you last met in this City, we have

had our troubles. As you know, on the night of May 4th, 1901, about all that we had left of the greater portion of our city was a bed of ashes, and we had the same courage, we had the same spirit here as was shown by the Horticulturists of the State of Florida after the great freeze of 1895. We are proud of what we have to show to-day as a result of our efforts to build up our city. You met in the Board of Trade rooms on this spot, but we have planted a better building, one better adapted to the purpose and what we have done has been accomplished by all of our citizens who have built beautiful homes, handsome churches, schools and public buildings. That we have a better city, I do not need to say. The fire and freeze have been the means of promoting the welfare of the city and State, as it seems that both have spurred our people to renewed efforts and it is evident that our city to-day as a whole, is in better condition than if we had had no fire in 1901.

I do not wish to occupy your time further. People who know me, know that the Horticultural Society of this State has no warmer and better friend than I am. All I want to say is, that when this Society meets in these rooms, they do not need any one to welcome them here. This is their home. (Applause.)

President Garner's Address of Welcome was followed by response on the behalf of the Society by Rev. E. V. Blackman.

**RESPONSE FOR THE SOCIETY.**

*Mr. President, Ladies and Gentlemen:*

When I received the invitation from President Taber to reply to the welcome address to be delivered by the silver-tongued and eloquent President of the Jacksonville Board of Trade, my mind went far back into the past. When I was a mere stripling of a boy, trying to make my way through the first term of an academy as best I could, a few days after my arrival, while all the faculty and students were strange, a public reception was to be tendered in honor of the new students. Probably a greener country boy never went from his home to battle with the uncertainties of school life. I was greatly surprised when the president called at my boarding house and informed me that I had been selected to answer the address of welcome, which was to be delivered by one of the students who was to graduate at the close of the term. I entered a most vigorous protest. I almost got on my knees before the august and austere man, begging him most piteously to let this burden fall upon other shoulders, but Dr. Carver was a man who never changed his mind or plans. After hearing my plea, he, with his majestic mien and a conqueror's tread, passed out of the door, simply saying, "I expect you to obey my commands." In the home, I had always been taught to obey; in fact, I knew nothing else. With this command ringing in my ears, and with the thought, "you must do it," I began to think of what I was going to say, and how to say it. The more I thought, the more I studied, the more scattered became my thoughts. Finally, for a starter, the old saw came to my mind, which perhaps has been used for centuries by the youth of our land in their first attempts at oratory, "You would scarce expect one of my age to stand before you on this stage." How I got through this trying ordeal, or what I said, I have no recollection; but suffice it to say that in the morning papers there were no startling headlines announcing the brilliant and witty answer to the welcome address, neither did the reporter come and ask me for a copy of my remarks. All this came back to my mind, then the present, with all

the multitudinous duties, crowding and pushing themselves into every flying minute, and I remembered the almost scores of members of this body, whose eloquence has stirred the hearts of the members at the annual meetings year after year, and I said, "I cannot do this;" and had it not been for friends in whom I have great confidence, I should have declined this honor, for a great honor it is. But, true to the teaching of my honored and loved parents, who taught me to obey the commands of my superiors, not questioning their wisdom, or the justness of the command, I consented to try to do my best, feeling that angels could do no more.

After listening to the brilliant and eloquent address from the honored President of the Jacksonville Board of Trade, we feel more keenly than before how futile will be our attempt, how far short it will come of what it ought to be.

Mr. President, Ladies and Gentlemen, the honors heaped upon the members of the State Horticultural Society by your honored President of the Board of Trade are highly appreciated. No body of men or women, gathered largely from the rural districts, or from the cities and towns, could have received a more hearty welcome than has been tendered us by your gifted and eloquent President. We would be heartless indeed if we did not in the highest sense appreciate these compliments, and this welcome.

In turn, we also have hearts full of compliments for the citizens of Jacksonville, the Gate City on the North and the metropolis of the State of Florida. The city, although fire-swept and devastated, has not failed in measuring up to her opportunities, and today stands as the chief business center on the South Atlantic Coast. A little while after the great fire which swept away happy homes, great business and manufacturing establishments, we stood a little way from where now stands the palatial Windsor, with a friend from New York. After viewing this scene of disaster and ruin, my friend said, "Jacksonville will never recuperate from this awful loss." How little he knew or realized what kind of material the citizens of Jacksonville, yea, the citizens of this great State are made of. We have not a people who, under the most bitter trial or devastating losses, be they from flame or frost, give up in despair. The citizens of Jacksonville and the State of Florida are made up of a people who know no such word as fail. Under the most trying and adverse conditions we have seen them rise in their might, and from what seemed absolute wreck and ruin, their all swallowed up, they gathered new strength, new energy from each disaster, until today, through their efforts, the wilderness and the solitary place have been made to blossom like the rose, greater and more premanent successes have been attained, yet we are but in the beginning of a new era of prosperity, which in the near future will place the great State of Florida at the head of the list of the golden chain of States which make up our great and prosperous Commonwealth.

When the frost king came, ruthlessly sweeping away the works and fortunes of men, that had been accumulated by years of privation and toil, the more northern sections of the country said, "This is the death blow for the State of Florida. The only industry in the State has been swept away, the planters have been left penniless, their hearts are broken, and they will never have the courage to replant." It was this awful chastisement and disaster that awakened the farmers of Florida, and made them grasp the opportunities which had been an unknown quantity before. Out of this disaster and seeming ruin, the State, as a whole, has emerged from darkness and is enjoying a greater degree of pros-

perity, has builded on better and more substantial foundations, her horticultural and agricultural districts are teeming with new life, new and more substantial industries have been introduced, the cities and towns are making phenomenal growth, and the whole State bears the unmistakable marks of a permanent prosperity which, in the old days, was unknown and unlooked for, and could not have been. Although your fair city was scourged by fire, perhaps it took just this disaster to awaken your people from a state of lethargy and indifference to the opportunities for expansion, the building up of a greater and more prosperous commercial center. Over the ashes of happy homes and great mercantile houses, there have arisen, Phoenix-like, better homes, larger and better equipped mercantile establishments, business interests have been expanded, manufacturers have come to your city, and New Jacksonville today is the pride of the whole State. In her swift race for business supremacy, Charleston and Savannah have been left far in the background. Yet, your prosperity, the bringing in of new and important industries, your expansion, has but just commenced. He who lives to see Jacksonville ten years hence, will see a city of magnificent proportions, her population doubled or thribbled, and one of the chief manufacturing and wholesale centers of the United States.

Mr. President, we, the members of the State Horticultural Society, rejoice at your eloquent welcome; yet, if you will pardon us—and we believe it a pardonable pride—we wish to say, as horticulturists and agriculturists, we deserve this recognition. We point with honest pride to the fact that, were it not for the horticulturists and agriculturists of the State, this whole region, now known as the State of Florida, teeming with life and activity, and great business interests, would be a wilderness inhabited by wild beasts and the Seminole Indians. You, with all true thinking men, know that the basis of all real prosperity depends entirely upon the development of the horticultural and agricultural interests of the State. Neglect these, and the whole social, mercantile and business interests of the State would fall into decay. If these industries should be abandoned and the field and orchard untilled lapse into a state of nature, the great manufacturing establishments would close their doors, the great mercantile houses would go into bankruptcy, the iron horse with its long train would soon be a thing of the past. It was this great fact, that all true prosperity depends entirely upon the tillers of the soil, that brought to our fair State such men, with their millions, as Henry B. Plant and Henry M. Flagler. These men recognized the fact that, could this commonwealth of Florida be settled with a prosperous, industrious people, her untilled acres turned into profitable fields, that a way of carrying their produce to the markets of the world must be provided. Each had great faith in the future of their section of the State as a horticultural and agricultural section, and all honor is due to these gentlemen for the expenditure of their millions in giving the farmer two through trunk lines of railroads; one running down through the center of the State, far into the Southern country on the West Coast; the other, a line from Jacksonville south on the East Coast, which will soon reach the last acre of land to the south on the mainland of Florida. There was a vast difference in the methods of these two multi-millionaires, who have done so much for the State at large. Mr. Plant extended his line southward largely as the demand for transportation came. Mr. Flagler blazed his way into an unsettled and unknown wilderness. His large resources, his faith in the soil of the lower East Coast to

produce vast quantities of fruit and agricultural products when brought into cultivation, gave us the Florida East Coast Railway. No sooner were the rails laid, or often anticipating the coming of the iron horse, new settlers were in advance. It was not, as a rule, the merchant, the manufacturer or moneyed men who kept pace with the building of this great enterprise, but it was the horticulturist and agriculturist who plunged into the forest, relinquishing the pleasures and advantages of old settled communities, to make a start in a new place under new conditions, and in a part, (the tropical section) a new world, where climate and soil were a sealed secret. It was not for the benefit of the throng of tourists that annually come to the State that the building of these great trunk lines was brought about. Their coming, and the wealth they would leave behind, was but a secondary consideration that led these great capitalists to spend their money freely in the building of these roads. The prime and overshadowing reason was that the farmer, the tiller of the soil, the man with the hoe, should have rapid transportation, that the products of their fields might be sent to the distant markets of the North. These gentlemen knew that villages and cities, with mercantile establishments and giant manufacturing plants, would follow in the wake of the tillers of the soil, the uncrowned kings and queens of the earth.

In the transformation of the State of Florida from a wilderness, the railways and the hardy, honest sons of toil have worked side by side, hand in hand, and that which has been accomplished in a few short years has been marvelous. Neither the one nor the other, working single-handed, could have brought about these results.

It is estimated that the next orange crop will reach the enormous sum of 3,000,000 boxes. With another favorable winter, there will probably be 5,000,000 boxes the year following.

In the southern section of the lower East Coast, where the growing of citrus fruits is in its infancy, many thousands boxes will go forward next year, then year by year, as the young groves come into bearing, the output will be more than doubled each year. Besides the citrus fruits, there have been and are being planted large acreages in mangoes, Avocado pears, sapodillas and other purely tropical fruits. Thus you see, as the great commercial and manufacturing interests are increasing in your city, gathering about you a larger population, and producing more wealth, the horticulturist is not forgetting his mission, but steadily and more intelligently he is cultivating the soil, bringing about greater and better results.

E. V. BLACKMAN.

## PRESIDENT'S ANNUAL ADDRESS.

*Members of the Florida State Horticultural Society, Ladies and Gentlemen:*

Meeting as we do today in peaceful force in this splendid new hall in this splendid new city, there is one word which more forcibly than any other emphasizes the thought uppermost in my mind, and that is the magnificent word, Progress. On every hand our surroundings show evidence of progress and prosperity, the natural results of well directed, united effort—united in the sense of city and country working together.

This beautiful Board of Trade building in which we are convened stands as a tan-

gible expression of the progress of the city which is our host. But it also stands for more. It stands as an expression of the progress of the adjacent country; of the smaller towns and villages scattered throughout our State, and, finally, of the rural population, the producers, who make possible those towns and villages. In a large sense the conditions that prevail in a city are a reflex, an emphasis, an accentuation of the conditions that obtain in the country. City and country are, and must ever be, inter-dependent each on the other.

The freight trains that roll southward in endless procession and pour out their contents in this Gate City of our State, and the steamers that pile high its docks with every conceivable kind of merchandise, must carry back to the land from which they came, products of some kind, compensatory in value to those brought in, else there can be no lasting basis of prosperity.

And it is as a very large and very active band of producers that we of the country meet with our city friends today; not in any sense as strangers, but bound together in the closest kind of business relationship. For I think I am safe in saying that this Florida State Horticultural Society has done more than any other organization in our State toward increasing the quantity, the quality and the value of these compensatory products without which the city of Jacksonville would not and could not be the bustling, thriving city that it is today.

In times past this Society has partaken of the traditional bread and salt not only of this city but of other sections of our State and, in every instance, we have come away with the feeling of cemented friendship that such partaking is supposed to engender. But now we feel that we have returned home again. We are glad to accept the welcome of this city at its face value and to believe that her people like us to feel at home.

In listening to the eloquent and cordial address of welcome tendered us today by the President of this Board of Trade, Capt. C. E. Garner, I am forcibly reminded of past cordialities extended this Society by the same gentleman, and particularly of a remark made by him to me in May, 1901. At that time, as many of you will remember, this Society was to have held its annual meeting in this city, but on account of the terrible fire our place of meeting was changed to St. Augustine. Captain Garner was at that time president, not only of this Board of Trade, but of the Fire Relief Association as well. Burdened as he was with innumerable duties, and those of the most arduous character, he found time to say to me, and, in saying it, voiced, I believe, both the sentiment of his own great heart and that of the city of Jacksonville: "Brother Taber, please say to your Society and to the good people of St. Augustine, that in addition to the losses Jacksonville has suffered by fire, she feels the loss of the Horticultural Society meeting."

Is it any wonder we feel at home here? Would not we, as guests, be sadly lacking in courtesy to our host should we refuse to feel at home with the remembrance of such an expression, coming from such a source at such a time?

I have said that the word progress is to my mind a magnificent word. Some may inquire: Why stop at progress? Why not say fulfillment, accomplishment? I will tell you why: Because the high aims and purposes of a Society like ours can never be fulfilled or accomplished in their entirety. They are too vast and too far-

reaching to admit of finality. Certain phases of our work may be, and have been, settled for the time being—but only temporarily so. To admit finality in a given direction is to put up the bars to progress in that direction.

I have never been able to satisfy myself that the word contentment, which is continually rung into our ears by some as being the Alpha and Omega of everything desirable in this life, is always rightly used or rightly interpreted. It seems to me its meaning can easily be, and often is, construed into the very antithesis of that which makes for advancement, for progress. The savage who supplies his limited wants from the depths of Nature's primeval forests drawing upon them for the, to him, all sufficient requisites of shelter and warmth and food may be typical of contentment, but he certainly is not of progress. And so up through all gradations of advancement to the highest types of present day civilization, ameliorating changes have been wrought out by those who were not content with existing conditions.

We honor and venerate our forefathers for what they were and for what they did, but honor and veneration carry with them no circumscribed limitations to progress. It is not enough to be content with life if that content is based simply and solely upon what our grandfathers or fathers did, neither is it always enough to follow step by step their exact footprints — however good they may have been. Our work commences where theirs left off, from the vantage ground to which they had attained, not from which they started. The tracks they blazed, if leading in the right direction, must be extended and become well-beaten highways; but, equally so, paths started either by them or us, that seem devious or wrongly laid must be abandoned and supplanted by others that offer a more direct and better way. It is not enough to let our lives flow smoothly along the channels of least resistance and, for this, take praise to ourselves that we are content. That our fathers progressed is sufficient mandate upon us, if we would honor them, that we must progress also. Contentment with our lot is good only as it comes from a knowledge of the full exercise of our best powers both of mind and body; of duty well and fully done, and that duty is to ourselves and to our children's children.

And it is with a great deal of pleasure that I call the attention of the Society—and of others interested in our work—to the fact that we, as a Society, have not been content to do less than the best that was in us toward furthering the aims for which we organized. Had we been content, our Society would certainly not have grown from the eighteen charter members of sixteen years ago to the unparalleled number, as compared with similar State organizations, of over eight hundred, shown by our printed report for 1903. A full record of our progress would, of course, have to take into consideration not only our wonderful increase in membership during those sixteen years, but also the past and present status of the work in which we have been and are engaged. A review of this kind would be too lengthy at this time, and is perhaps hardly necessary, inasmuch as the files of our annual reports contain the full proceedings of our meetings. Suffice it to say that we have tried to have the value of our work keep pace with our increased membership; or perhaps a better way to put it would be, that others seeing our work increase in value have wished to partake in it and have therefore become members. Either construction is good, and both are synonymous with progress, so long as the membership increases in numbers and the work in value.

One feature of our work which it seems to me is so valuable as to demand specific notice is the cataloguing of our fruits. This fruit catalogue, which appears in our printed reports, carries with it great weight, for behind it is the official sanction of the Society: First, as to species and varieties that should be listed; secondly, as to proper descriptions, and, thirdly, as to respective merits of these varieties for different sections of the State. Such a list to be of service must receive frequent and very careful revision. A committee appointed on "New Fruits and Revision of Catalogue" will make report at this meeting, and I bespeak for it your earnest, careful consideration.

And now, having spoken of the progress of our State and of the important factor that this Society has been and must continue to be in this progress, the words which I wish might have been hopeful and helpful and cheerful throughout, become less bouyant, and a minor key enters into the theme, as it becomes my sad duty to allude to that which has come into the lives of some of us since last we met. This year, as in some of those gone by, it has become my sad duty to appoint a Committee on Necrology. The report of this committee will be made later on in the meeting and, for reasons with which many of you are familiar, I could not find words to forestall this report, even if I would. I simply know that the heart of each member of the Society will go out toward those who are afflicted; not alone because of any sense of personal loss that any of us have sustained; not alone because of the goodness and graciousness and estimable qualities of those who have passed from our midst; but also because of that magnificent, god-given trait of humanity, that world-encircling bond of human sympathy, which at such times, as some of us have had recent experience, makes the whole earth kin.

I shall make only such further brief mention of the subject as seems necessary in connection with the loss of our esteemed Secretary, Stephen Powers. Immediately following Mr. Powers' death, which occurred on April 2, I appointed Aubrey Frink to serve as Secretary up to the time of this meeting, and a few days later I appointed E. O. Painter, Assistant Secretary for the same length of time. I would recommend that immediate action be taken by the Society electing Mr. Frink and Mr. Painter to serve in these respective positions during this meeting. I would also recommend that when the permanent Secretary is elected for the ensuing year, his term of office should be defined as commencing immediately after the adjournment of this meeting and to continue until January 1st, 1906, the time at which the term of other officers to be elected at this meeting will expire. Disposed of in this way, there would be no break in the Secretaryship and the time would be clearly defined as to when the duties of one Secretary leave off and those of another commence.

To my mind, one of the most hopeful signs in connection with our work, and the one more strongly indicative than any other of enduring life and constantly increasing usefulness of this Society, is to be found in the fact that the younger generation is taking, year by year, added interest in horticulture, and in this Society as its State exponent. That this gratifying condition exists, we have abundant proof, and the reason is not far to seek. It is that "Advancement of Horticulture" which forms this Society's basis of constitutional life, receives year by year a wider, deeper, fuller interpretation and significance as, year by year, the limitations set by nature

upon her productions become further and further removed and the possibilities of more completely governing these productions, both in character and extent, by our own will and skill become more apparent. It is that the horticulture of today is an inviting science worthy of the best efforts of any scholar; repaying us, her devotees, just in so far as we can digest and apply her lessons, continually beckoning us on to still higher achievements. It is that a man can spend a lifetime—or a dozen lifetimes, if he had them—without sounding to the bottom the wells of research which are constantly opening up and inviting investigation under this magic word, horticulture.

Take, for instance, the one feature of advanced horticulture that deals with the crossing of species and varieties by artificial pollination and making, one might almost say, to order, absolutely new varieties; combining into one fruit just such characteristics as seem desirable, supplying from the parentage on one side added size or vigor or productiveness and from the other an added touch of color, flavor or juiciness. Is there anything in the whole realm of science that can be more fascinating? Astounding results have already been produced in this direction in widely separated sections of our country, and one of our number, Dr. H. J. Webber, now in charge of the Laboratory of Plant Breeding of the United States Department of Agriculture, will deliver an address on this most interesting and important subject at this meeting.

But there is still another reason for our love for and interest in horticulture; a reason that extends infinitely beyond the realms of science and passes down, unheralded and untaught, from generation to generation; a reason that completes and overlaps the circuit of all knowledge and starts again with the child in the cradle. This reason is the divinely implanted instinct that accompanies many of us from infancy to age, to surround ourselves with the beautiful. It is the instinct that finds expression at the hands of every child who plucks a flower, that will perish in a day, and the instinct of the man who plants an oak that shall live a century. If we look, as we distinctly do, upon the commerical and scientific side of horticulture as laudatory, then let us consider this home-ornamentation side, this cheering, brightening, life-worth-living side, as obligatory.

And now, ladies and gentlemen, our Society has a vast amount of work laid out for this meeting, as you will see by consulting the program, and not only work, but recreation; for the people of this city have nearly overwhelmed us in their generosity of good things offered. To get time to show our appreciation of this generosity—by partaking of it—we shall have to work assiduously or else go away with our program incomplete. I trust, therefore, that the Society will aid me in expediting business in every way possible. We have been made to feel at home here by this Board of Trade and by this city, and in return I express, for the Society, the hope that the people of Jacksonville will feel at home with us while we are here. They are cordially invited to attend our meetings and to glean whatever of interest or value they can from our deliberations. We thank those who have honored us with their attendance tonight for having done so.

In closing, allow me to express the hope that this Society, this Board of Trade, this city and this State, may be partakers together in the long continued term of progress and prosperity that we believe has already commenced and that will surely abide with us, if each of us, as indi-

viduals, do our best to further it. Let us be content with nothing less.

GEO. L. TABER.

The Society had the pleasure of listening to the following excellent address on "Plant Breeding" by Dr. H. J. Webber, of the Department of Agriculture, Washington, D. C.:

## PLANT BREEDING.

*Mr. President, Ladies and Gentlemen:*

It gives me great pleasure to have this opportunity of meeting with you again after an absence of several years. I find on returning to Florida that I have not lost interest in the State and still feel that it is my home. No State has more to be proud of than Florida. While primarily a fruit growing State, it is probably true that no State is more various in its agricultural products. In the northern part of the State cotton and pears, peaches, and strawberries are grown; in the middle part of the State orange growing and vegetable raising are the chief occupations; and in South Florida with its semi-tropical conditions, oranges, lemons, pineapples and other tropical fruits are produced. All of these tropical and semi-tropical products have been largely neglected so far as breeding and improvement is concerned and the subject of plant breeding is of primary interest to the growers of the State. I find that some people are surprised when it is stated that we can breed plants, though it is now a well established and generally recognized fact that plants can be bred the same as animals. Since the time of Knight and Van Mons, in the last century, we have had a fair understanding of the methods of plant breeding, and the history of agriculture is rich in illustrations. The forefathers coming to America brought with them fruits and grains of the Old World. These varieties and races of plants were not adapted to conditions in this country, and it soon became manifest that new varieties and races must be developed if they were to succeed. Very early in the history of the country we find Massachusetts organizing a horticultural society which offered premiums for new and improved seedlings of pears, apples, grapes, etc. This resulted in the securing of very valuable new native types which gradually superseded the original imported ones. As civilization spread westward and the imported varieties that had succeeded in the East were taken to western regions, we again find the same history of development. On examining the lists of fruits grown in New England now the majority are found to be of native origin. In the same way in the States of the West, native varieties originated there and were adapted to the conditions, gradually replacing eastern and foreign varieties. In the great Northwest where the demand is for hardy apples and plums, we are importing eastern varieties and varieties from other countries, but every intelligent grower realizes that this is only temporary and that sooner or later native sorts must be originated which will take the place of these. Many persons can remember the great advance that has been made in some of our native plants. Only slightly more than a half a century ago the tomato or "love apple" was regarded as injurious and not fit to eat and was cultivated for the sake of its small beautiful red fruits. Within a few decades this plant has been modified in form, trebled or quadrupled in size, and greatly improved in quality until it is now recognized as the queen of vegetables. Such illustrations show what wonderful development can be produced in plants, and I use the word produced advisedly, for without man's agency in selection such progress would never have been

attained. Man furnishes the conditions and nature does the rest.

### FACTORS OF BREEDING.

The material with which the breeder works is variations. If a row of seedling orange trees is examined it is not difficult to discern that each tree possesses an individuality, that is, each has a peculiar mode of branching or shape of leaf or some other peculiar character distinguishing it from the others just as certainly as men are distinguished by forms of face or figure. These variations are found to be of varying degrees and the plant breeder finds that by selecting the most striking variations which have characters of value that they may be able by careful breeding to accentuate and fix this character and develop a stable race which will produce the character regularly under normal conditions.

The variations which normally occur, however, are not sufficiently extensive to give us all the characters we desire and it is frequently necessary to resort to hybridization to produce the desired combination. Frequently two species or varieties present characters which, if combined in a new variety, would give greater perfection, and by combining these two species or varieties in a hybrid the breeder may produce new strains having this desired combination of characters. The variation once secured, careful selection of mother plants will then suffice in most cases to improve and fix it into a stable variety. We can best understand these general methods by a discussion of different illustrations.

### BREEDING CITRUS FRUITS.

You are all of course more or less familiar with citrus culture and citrus improvement and illustrations which may be derived from this industry will thus appeal to you especially. Some of you may remember that several years ago when Mr. W. T. Swingle and myself were located in Florida studying orange diseases, we became interested in citrus improvement and started somewhat extensive experiments in this field. Our work began about the time of the great freeze of 1894-5, which demonstrated that the great desideratum of the Florida grower was a hardy orange which would resist frosts and freezes. Other problems of importance also presented themselves and were taken up. If, for instance, it were possible for us to produce a kid-glove orange of the size, quality, and flavor of the ordinary orange, it would be of the greatest value. New and novel fruits of all kinds furthermore are greatly desired. We thus made numerous hybrids between the different types of citrus fruits and have been conducting work since that time, examining the fruits and making selections. In the production of a hardy orange two methods present themselves. One method would be to select the most hardy seedlings of a certain individual variety. Observation, however, has shown that among thousands of orange seedlings only a very slight degree of difference in hardiness exists, so that it would require an indefinitely long period before any results could be achieved in this way. The second method would be to hybridize the ordinary tender sweet orange with some hardy type. As is well known the Trifoliate orange has been used extensively as a hardy budding stock, and withstands the winters as far north as Pennsylvania and southern New York. The fruit of this tree is small, bitter, very seedy, and worthless so far as edible qualities are concerned, but it has the hardy cold resistant character which it would be desirable to combine with the good fruit qualities of the commercial orange. It would seem more certain and quicker to secure a hardy orange by hybridization of the

common orange with the Trifoliate orange than by straight selection. Many experiments were made therefore in hybridizing the Trifoliate orange with different varieties of the sweet orange, and while it was found that the hybrid was very difficut to make, nevertheless a few crosses were obtained and some of these have been fruiting for the past two years. It is gratifying to be able to state that these experiments have now gone far enough to justify themselves and to justify the hope that hardy fruits of value for this State may ultimately be obtained. The first generation hybrids differ considerably in quality and no two of them that have thus far fruited, are alike. In the majority of cases the fruits are rather sour and bitter, considerably larger than the Trifoliate orange, very juicy, and nearly seedless. Most of them are too bitter and sour to be of value as yet. Two varieties, however, have been selected which certainly in their present condition will prove of value for cultivation in the Gulf States where oranges cannot now be grown. The fruits of these two are about the size of small Tangerines, have thin skins, are very juicy, and have a tender flesh, and furthermore they are almost seedless, averaging about one seed to two fruits. The fruits of these two hybrids are rather too sour to be eaten out of the hand, but they make a delightful "ade" similar to that made from lemons and limes, make good pies, preserves, and marmalade, and can be used for culinary purposes where the lemon and lime are used. They begin to ripen about September 1 and continue to ripen up to December 1. They are sufficiently hardy so that they can be grown unprotected in South Carolina, Georgia, and other States of that latitude. I think we can say without hesitation that they will prove valuable additions to the fruits of these States to cultivate as a home fruit. That section of our country greatly lacks acid fruits and these two oranges are sure to be of value there. In their present condition they are not of value to Florida growers who can grow the ordinary sweet orange, but on the other hand it may be said that they will not conflict in any way with the market for Florida fruits, for, as indicated above, they are fruits valuable mainly as home fruits for culinary purposes. It may be said, however, that these results are simply the beginning. We feel certain that these varieties are the progenitors of a new group of hardy citrus fruits, and that ultimately seedlings of these can be produced which will give the people of this and other States hardy oranges probably nearly or quite equal to the present excellent sweet oranges for which this State is noted. We hardly expect that an orange of large size and the best quality will ever be produced in northern latitudes, but I think we may hope to obtain such hardy hybrids that in the long season you have here and under your climatic conditions, will give good fruits.

Another fruit which has been produced as a result of these experiments is what we are calling the "Tangelo," which is a hybrid between the Tangerine and Pomelo. It is in reality a small kid-glove grapefruit. The skin is more highly colored than that of the Pomelo and has the loose skin, kid-glove character of the Tangerine. The flesh is more reddish than that of the Pomelo and has a similar sprightly acid flavor to that fruit, with the bitter quality greatly reduced. If this fruit could be put on the market and its qualities recognized we feel sure that it would be of great value. Only time and general cultivation, however, can determine how it will succeed as a general market fruit.

Many hybrids were made with the idea of securing an ordinary orange having the kid-glove rind of the Tangerine. Among these were hybrids of the Parson Brown and the Dancy Tangerine. Some of these seedlings among those which have thus far fruited appear to be of value. They are not, however, what was expected. They appear to be true Tangerines in all of their qualities, but are larger, and earlier than any variety of Tangerine yet produced so far as we are informed. We feel certain that two of these fruits will prove of value for general cultivation in Florida. Among these hybrids only a few have thus far fruited and many other interesting results may be expected before the completion of the experiments. All of the fruits described above are of practical value without further breeding. They are what are known as "clonal" varieties,* i. e., they are propagated by budding and grafting, and therefore do not need to be bred and selected to fix them into stable types coming true to seed.

BREEDING TROPICAL FRUITS.

Other Florida fruits present great possibilities from the standpoint of the breeder. The pineapple, which is probably the fruit of the next greatest importance in Florida, is worthy of the most careful experiments. We demand more varieties with smooth leaves, more hardy varieties, varieties producing superior fruits, disease-resistant varieties, etc. A few years ago the tendency was to cultivate a large number of fine imported varieties like Enville City, Ripley, Lord Carrington, Queen, etc. These varieties have now largely disappeared. Now you cultivate the old Red Spanish, the hardiest variety known and the best shipper but a coarse, acid, acrid fruit. You still grow the Smooth Cayenne and Abbaka but only in limited quantities. The Department has for some years had experiments in progress in the breeding of pineapples with the object of producing new varieties possessing these desirable qualities. About four hundred hybrids have been grown and it is interesting to note that the great majority of these produce fruits surprisingly good in quality. We have had these hybrid fruits forwarded to us from Florida in large numbers for the last three years and have had the opportunity of frequently comparing them with fruits of different varieties found in the market. In no case have we been able to secure fruits on the market that were equal or superior to the hybrid fruits. It is true that a few of the crosses fell down in quality, but the majority of them are far ahead of the ordinary fruits in many respects. Many of them have smooth leaves and many of them have shallower eyes than any variety now cultivated. It is certain that ten or twelve varieties possessing marked improvements will be secured.

When one considers the great value of a seedless or nearly seedless guava or a stringless freestone mango the great importance of work of this character may be understood.

BREEDING PLANTS PROPAGATED BY SEEDS.

The illustrations which have thus far been presented are drawn from fruits which are propagated by budding and grafting—"clonal" varieties, as distinguished from seed propagated varieties, which are known

*Varieties of plants which are propagated vegetatively by buds, grafts, cuttings, suckers, runners, tubers, etc., are now known as *clons*, or clonal varieties, in contradistinction to varieties which are propagated true to type by seeds which are known as *races*. The Jaffa, Valencia, Satsuma, Washington Navel, etc., are examples of orange *clons*.

as races. When we come to deal with crops like cotton, corn, wheat, tobacco, etc., where the races are propagated regularly by seed, it is necessary that the variety be carefully bred and selected until it comes true to seed. Here we have the same possibility of selecting variations and of producing variations by hybridization, but whenever a variation has been secured the seed must be sown in an isolated place and carefully selected, taking each year seed from such plants only as show the same variation until that variation has been "fixed," so that all of the seed produces the same type. As an illustration, cotton growers need varieties with longer staple which are adapted to cultivation in upland regions. The cotton which is now grown all over the cotton belt is mainly of the short staple type, the fiber of which ranges from three-fourths to one and one-eighth inch in length. These varieties have large bolls which open well and are easily picked and well adapted to cultivation in upland regions. In a limited area in Northern Florida and Southern Georgia and on the islands off the coast of South Carolina, the fine, long staple Sea Island cotton is grown which has a fiber from two to two and one-half inches long. This cotton, however, has small bolls which are very difficult to pick, and it is not adapted to cultivation in upland regions. The problem before the experimenter is to hybridize these two types of cotton and produce an intermediate hybrid type which will have a fiber intermediate in length but longer than any of the short staples now grown, and have bolls that open well and are easily picked. They must also be adapted to cultivation in upland regions like the ordinary short staple upland varieties. Within the last five years, in the course of our work in this field, we have grown several hundred thousand hybrids of this kind, and from among them have selected strains which possess in a remarkable degree the combined qualities desired. The first generation of these hybrids are nearly intermediate between the two parents and are very nearly alike and are very unproductive. When we grow the seed from these first generation hybrids and get hybrids of the second generation, there is a splitting up of the characters and a recombination so that almost every form and combination of character imaginable can be found. It is in this second generation that hybrids of the desired types must be selected, and this is true of practically all plants propagated by seed. Among the very large number of second generation hybrids only a very few will be found which give the desired combination of characters. In our own experiments twelve different types were selected from a field of ten acres of second generation hybrids. These twelve different types have since been grown each in an isolated patch. In the third generation a large number of the hybrids broke up and did not give the desired qualities. These were weeded out and only the very best having the desired qualities were selected for the next year's propagation. After four years of such selection several of these twelve are approaching fixity and are as nearly uniform as many standard varieties.

In the same manner new races of corn, wheat, and similar crops can be produced. This, however, is only a small feature of the work which should be conducted with seed plants. One of the important lines of plant breeding work which is assuming prominence within recent years is the pedigreeing of seed of standard races, which is another form of breeding. Animal breeders have found from centuries of experience that it pays to keep a record of individuals so that they can trace the performance of any in-

dividual and find what it is capable of doing. We know, for instance, in the case of the famous bull, "Favorite," that his great value resulted from a strong tendency to transmit to his progeny his good qualities. So in plants it is just as important for us to know that a certain individual corn plant which possesses the ability to yield heavily also possesses the ability to transmit this tendency to its progeny. Experiments which have been conducted with corn, cotton and other crops show that by selecting numerous individuals and growing their progeny separately, so that we can obtain a measure of their transmitting power, we are able to determine which ones will transmit this quality, and in the second generation make selections of individuals from the progeny of those which have shown the strongest transmitting power. By carrying out this policy from year to year it has been found possible to greatly increase the yields of many crops. In Minnesota, Professor Hays, working in cooperation with the Department of Agriculture, has produced varieties of wheat which yield from three to five bushels more per acre than the parent variety. In the case of corn and cotton this has also been demonstrated to a marked degree, and if such methods of selection should be carried out uniformly with our various agricultural crops it would doubtless result in an increased yield of from one-fifth to one-fourth more than that now obtained.

In conclusion, I desire to emphasize the necessity of every grower giving strict attention to the methods of seed improvement. It is just as important for a grower to adopt a careful system of seed selection as it is to carefully cultivate or manure his crops. The important results in increased yields, vigor, etc., which have been secured by seed selection show us that it is one of the most important factors of success in the production of a crop. No grower can afford to neglect so important a matter. Every farmer and every horticulturist should understand the principles of selection and become a plant breeder. It is not only profitable but intensely interesting.

H. J. WEBBER,
In Charge of Plant Breeding Laboratory
U. S. Department of Agriculture.

President—We will now hear the report of the Local Committee, consisting of E. O. Painter, Chas. R. Tysen and Lorenzo A. Wilson, all of Jacksonville.

**REPORT OF THE LOCAL COMMITTEE.**

Mr. Painter—In behalf of our Local Committee, I wish to report that all necessary arrangements have been made for the entertainment of the Society while in Jacksonville. The Board of Trade, besides tendering us the use of its beautiful new hall, has also arranged for an excursion on the river at 10:30 tomorrow morning, to which all the members of the Society and their friends are invited. The Board of Trade has gone farther than this and has arranged for a Musicale for one evening during the session. The time to be named by the Society.

President—Owing to the loss by the Society of its valued Secretary, Mr. Stephen Powers, it becomes necessary to appoint a new Secretary for this meeting. What is your pleasure.

On motion, Mr. Aubrey Frink was unanimously elected Secretary and Mr. E. O. Painter, Assistant Secretary.

The session adjourned until 8:30 Wednesday morning.

# SECOND DAY.

### MORNING SESSION.

Wednesday, April 27, 8:30 a. m.

President—The first thing on the program this morning is a report from the Standing Committee on Pineapples, W. R. Hardee, Jensen; Wm. N. Whitten, Punta Gorda and M. C. Dollings, Orlando.

We have a paper on Pineapples in Cuba by S. S. Harvey. If there is no objection, this paper will be read by the Secretary.

### PINEAPPLES IN CUBA.

*Mr. President, Ladies and Gentlemen:*

The pineapple industry of Cuba was of considerable importance as early as 1880. The growers were prosperous until the revolution started in 1894 or 1895.

The largest crops previous to the past year were in 1891, 1892 and 1893. They were the glorious years for everyone connected with the business. Prices were as high as fifteen dollars per barrel—equal to six or seven dollars per crate.

Immediately after the war with Spain, and closely following American occupation, the farmers began to plant, clean out, and renovate the old fields, as a result of which the crop of 1900 was about nine million pines. Since it has increased until the crop of 1903 was about thirty million pines.

The estimates on the coming crop vary greatly, the prevailing expression being that the 1904 crop will not be as much as that of 1903. My own belief is that we will have an increase of more than one hundred thousand crates, i. e., we will ship a million crates.

In 1900, and previous to that, the crops were sold in the fields, all being sold by January 15th. The prices paid were based on thirty cents per dozen in the fields. There has been a gradual decline of purchasing and prices, until only about half the crop of 1903 was sold in the field, and the prices paid were based on twenty cents per dozen, the half that was not sold in the field being shipped on commission and netting the grower seventeen or eighteen cents, some growers netting not over fourteen cents in the field.

In December last, it looked as if all the growers would be forced to ship the crop of 1904 on consignment. There appeared to be an arrangement among the former large buyers, a kind of an "agreement among gentlemen," similar to others we have heard about. As the crate manufacturers had combined and raised prices, the transportation companies had agreed the product would stand a further squeeze, and raised rates, and the buyers and commission men had decided that they could force the growers to consign and carry all the risk. With it all it looked bad for the Guajiro (Spanish for Cracker) who produces the product; and lo, an angel appeared to relieve the much combined-against grower. By the time he had purchased a few good crops, say a hundred thousand crates or so, the New York and Chicago former buyers took "conniption fits," and rushed down again to prevent being left in the cold. They had been down in December and decided not to buy any this year. The result of the visit of the Angel is that

all of the buyers are rushing their money into field purchases, and at this time, February 15th, nearly all the pines are reported purchased at about twenty-five cents per dozen in the fields.

That is a good fair price in Cuba. Pines can be raised here for about ten cents per dozen—field sale—allowing rental value of land at $3.00 per acre.

Pines are not fertilized in the old pine belt, or any of the best land. There have been set out during the past year many plants on poor land (called sandy), and they will have to be fertilized if they grow well. I am anxious to see the result of planting on the poorer lands. I think the fruit will be firmer and better shippers.

In the early days of pines in Cuba, they were planted on red, chocolate, mulatto and black lands, all rich in plant food. The rich red land was found the best, and now nearly the entire crop is raised on the best high, red land.

Commercially, the Red Spanish is all the variety raised.

In the local market, Havana, the "Pina Blanco," "White Pine," are more valuable, and there are many of them raised. They are poor shippers at best, and their season being late, after our rainy season sets in, makes them a poor crop to attempt to ship to the States.

In the past, the pineapple district was only a small section west and south of Havana. During the past two years there have been set out considerable fields in all parts of the Island. The crop of pines in Cuba will materially increase during the next few years. I do not think it possible for the growers of Eastern Cuba to make any money, certainly not for many years to come. Transportation and delays will prevent any chance of profit.

Havana is the only point on the Island that has any transportation at all suitable for fruit, or other perishable products. I think it very doubtful if any of us will live to see any other point have any good fruit transportation.

The crop of vegetables of 1903 was very poor. There were about 85,000 crates sent to the States. The crop of 1904 is very good, and will go over 200,000 crates. Vegetable and pine men consider April their best month. The vegetables are about cleaned up by May 1st, but nearly half the crop of pines is shipped in May. The crop matures twenty per cent. in April, forty per cent. in May, twenty per cent. in June, and the other twenty per cent, during the rest of the year.

The best planters here throw up ridges fifteen to eighteen inches high, and they are usually five feet six inches center to center. The plants are set about one foot apart in the rows, making about 8,000 plants to the acre.

Plants are set out any week in the year. The crown plant (Coronas) from July to February, and the sucker plant (Creolas) during other months. The Coronas make in sixteen to eighteen months; the Creolas in ten to twelve months.

Planters usually prefer the former, claiming they make the best fields. It is expected to get three or four good crops from one planting. I have seen fairly good pines from a field eleven years old, and I cut a few good pines from a field that had been planted eighteen years. There was nothing like a good crop on these old fields, only an occasional good pine. The second crop is often better than the first.

I feel sure that Cuba will have a two million crate crop of pines in a very few years.

There is no organization among the growers, and they are the prey of crate makers, commission men and transportation companies, and they will suffer until they organize for self protection. The Ameri-

can vegetable growers have started an organization and it may extend to the pineapple growers, but, as most of them are Spanish, it will be a slow process, as they are very secretive and loth to let their neighbors know anything of their business.

The Cuban orange, grapefruit and lemon will fall on the markets like a great avalanche in a very few years. There are millions of trees planted, and more going in all the time. There will be groves well grown and taken care of, and many, as everywhere else, neglected. There are still thousands of people who think all that is necessary to produce good grove property is to punch a hole in the ground and stick in young citrus trees.

What of the quality? That is to be proven. Personally, I believe that Cuba will produce as fine citrus fruits as Florida. I cannot make it any stronger than that, for I am satisfied that Florida has produced the finest citrus fruits man has ever eaten.

S. S. HARVEY.

The following paper on Pineapples by W. R. Hardee, was read by the Secretary.

**PINEAPPLES.**

*Mr. President, Ladies and Gentlemen:*

Having been appointed chairman of a committee of three, consisting of W. M. Whitner, of Punta Gorda, L. C. Dollins, of Orlando, and myself, to make a report on pineapples at this meeting of the Horticultural Society, I could think of no better plan than for each one of us to make an individual report, from the fact that none of the committee are familiar with conditions other than in the section in which they resided. With these facts in view, I suggested to Messrs. Whitten and Dollins that this be done. The Secretary of the Society, in notifying us, stated: "You are appointed one of the committee on pineapples." Now, I should hate very much to feel called upon to relate the details of all the methods used on the East Coast in the growing of this very delicious fruit, and I take it that people generally care but little for such information, but that they want to know in a general way, from some one who has had years of practical and successful experience in the business, something of the development of pineapple growing, the sections in which they are grown most successfully and profitably; and when I used the term *section*, I do not mean as between the East Coast and the West Coast, or as between the East Coast and the interior, for I am not informed on this point sufficiently to enter into such a comparison, and will leave that for the members of the Society to determine for themselves when they have heard the reports from the three sections; but what I do mean is, as to the sections on the East Coast where they are grown to the greatest advantage and perfection. For many years a small territory, from Ankona (which is ninety miles south of Titusville, the county seat of Brevard county) to and including the St. Lucie River—a distance of about twelve or fourteen miles—was considered to be about the only strip of land that the maker of the universe had kindly set aside for the growing of pineapples in the United States, on the main land. This opinion was not based upon any demonstration that they would not grow anywhere else, but because, within this sacred precinct, the first were planted and did well, and as a settlement had been started, others who desired to go into the business preferred to settle where there were already a few neighbors, rather than go farther south or north, and in this decision they have proven that either by wisdom or luck, they have made no mistake; for there is no question, even at this time, that there is no other part of

the East Coast where they are grown in such quantities and so profitably as in the small territory named above. There has been, however, an enlargement of this belt, and, strange to say, the development has been more extensive to the north than to the south, until at this time, Fort Pierce, and several miles north are a source of great profit. A few months ago the writer was in the office of the F. E. C. Ry., in St. Augustine, looking up some statistics, and found that the railway had handled, during the season of 1903, a total of four hundred and eighty thousand (480,000) crates of pineapples from the East Coast, including shipments from the Keys. Of this number, *three hundred thousand* (300,000) were grown between Fort Pierce to and including the St. Lucie River, leaving but one hundred and eighty thousand (180,000) to come from the Keys and the balance of Dade county, which is, of course, south, and comprises a length of over one hundred miles. I merely mention these facts and figures to show from what a small section these 300,000 crates came, for it must be understood that the average width of this territory does not exceed one-half a mile, and it is only twenty miles from Fort Pierce to the St. Lucie River. I do not know the exact figures this entire crop brought in, but I am safe in saying $1.25 per crate, and we have three hundred and seventy-five thousand dollars ($375,000.00), and we feel that is about as good as we could do at anything else. No doubt some critic will say I have put the cart before the horse in telling what our crop brought us before I told how we grow it, what it costs to grow, etc., etc.; but as it is one of my weaknesses to dwell on the pleasant features first, and take up the burdens when I have to (for they come soon enough), my system will have to be passed over. During the past eight years, or more properly speaking, during the past six years, there has been more learned relative to the proper methods of growing pineapples than during all preceding time, which covered a period of perhaps fourteen years, making a total of about twenty-one years that pineapples have been grown on the East Coast. Like all undertakings, it is not always those who first lay the foundation, and to whom the credit of pioneering is due, that develop the business to its best results. This is true of the pineapple, for it has required years of study, years of close business methods, to produce the class of fruit that now goes from this section. In the earlier days, no one thought any fertilizer was necessary for the full development of a first-class pineapple but cottonseed meal. Today it is questionable if there is a grower on the East Coast who would think of trying to produce a crop on such a one-sided fertilizer. Years ago, when it became evident that phosphoric acid was necessary, the rock phosphates were used almost exclusively. Today it is a very badly informed man who would put it on his fields, if furnished to him free of cost. Instances could be cited where time and the careful, intelligent grower has grappled with these vital points as regards the fertilizing feature, and sifted the matter so thoroughly that various forms of fertilizer have been discarded, the result being longer lived fields, better fields, better fruit and more of it per acre. There is no doubt but what the pineapple business on the East Coast has suffered more loss and damage by injudicious fertilizing than from any other source, and even now there is continual damage done every year by many growers applying fertilizers of which they are ignorant of what they are made from. But this is growing decidedly less each year. Another factor which has increased the general condition for better results is the fact that growers are using more liberal quantities of fertilizers, two

tons per acre not being considered an excess per year, and also insisting that this two tons be of high grade and from ingredients known to be the best adapted for the purpose. This shows that it costs something to grow pineapples at this time, but there is more money made than when a thousand pounds were used per year per acre; and it is a known fact that some fourteen years ago, one of the pioneer growers ordered one ton of cotton seed meal for thirty acres, and upon arrival decided it was too much, and sold one of his neighbors half of it. It is needless to say that this grower soon passed out of the business. (Of course, when the fertilizer dealer reads the above, he will approve of the later day methods.)

Without going into details, I will sum up the situation by saying as to the cost of growing pineapples, that it varies from $350 to $400 per acre to get the first crop. A field of ten acres would therefore cost, to bring into bearing, at the outside figure, $4,000. This field, at conservative estimate, will yield a net income for from six to eight years, of $2,000 per year before having to be replanted. Many growers, including myself, have done better, but as this article is intended to cover the entire section and embrace the good, bad and indifferent, I wish it to be within the limit.

Before closing I want to say a word regarding the fertilizer dealers. In years gone by, these dealers were of the same opinion as the pioneer growers. They thought any old thing was good enough for the pineapple fields. All sorts and conditions of stuff was shipped out without the slightest conception of the needs of the plants which they were attempting to feed, and it took some pretty hard knocks to convince them that they did not know it all, and that acid phosphate was not just as good as some other form of phosphates. But the grower was stubborn, and after having practically demonstrated that it would not do, he would not have it. Yet the fertilizer dealer did not want to be convinced, and would come armed with analysis showing that there was not a trace of anything that could possibly injure the plant. The grower pointed to his field, where it had been used, and a sad looking sight it was. Then he pointed to a field where it had not been used. At last acid phosphate had to go, and now a condition exists which has done much to bring about results as we have them, to-wit: The growers and fertilizer men have organized themselves into a sort of mutual admiration society, the grower giving to the fertilizer men the benefit of their practical experience, the fertilizer man giving to the grower his best knowledge and skill in securing and compounding from the most approved forms of fertilizers those which produce the best results. It is to the interest of the dealers to furnish to the growers the best fertilizer that can be produced; otherwise he loses their trade. It is to the best interest of the grower to give to the dealer every fact that his personal experience and observation has brought him, so that by uniting this knowledge, a mutual interest and good fellowship may be fostered and engendered; and it is with pleasure that I can say that the leading fertilizer houses are meeting the growers half way in this matter, and much good is resulting thereby. In conclusion I will say that the State Agricultural College, of Lake City, is carrying on an experimental department on my place at Jensen, Brevard County, Fla., which has demonstrated some valuable facts relative to the growing of pineapples. This experiment is under the management of Prof. H. H. Hume and Prof. H. K. Miller. I understand they are to soon publish some of the results of their labors along this line, and I would advise every one to secure copies of same, as it

will contain much that is valuable, not only to the man just starting new in the business, but also to the man who thinks he *knows it all.*

Concluding, I will say the pineapple business on the East Coast never looked brighter and more promising than at present. W. R. HARDEE.

President—We have listened to the report of Mr. Harvey and Mr. Hardee. The subject is now open for discussion.

Mr. Boggs—In connection with the pineapple question, I wish to say that on my trips through the South I have seen a good many of the pineapple fields of Florida, but the very best patch of pineapples I found was a little plot about 1-4 of an acre in size. The owner had laid pine logs along every bed and hauled in pine straw and grass and covered the ground entirely. In fertilizing, the fertilizer was scattered broadcast over the mulching and allowed to wash down by the rains. The owner states that this was the easiest plan for taking care of a pinery. The place was in Cocoanut Grove near Miami.

Mr. McCarty—There are two or three points that I think want attention this year, and one is along the line of using high-grade materials in fertilizing. We have found during the last two or three years that nitrate of soda and other high-grade materials will give the best of results and that is what we want to get. Some years ago it was considered that the life of a pineapple was about six or seven years. We have prolonged this life considerably, and we think we can prolong it still further, but we must use the right kind of materials. The plan mentioned by Mr. Boggs will give you large crops. The more you fertilize and cover up the ground, the better will be your pineapples, the larger will be your crop. The old idea of putting the fertilizer under the ground, is fast going out of order. I wish to say that this plan of Mr. Boggs is a good one, and with high grade materials large results can be secured. I wish to say that our pineapple crop will not be so large as last year.

Mr. Wait—I would like to ask if the black heart is caused by the cold weather.

Mr. Stevens—The rot appears in cold weather and in some cases, we have reasons to believe that the pineapples are all right when they leave the packing house, but when they come in contact with the cold, they decompose. I would like to hear from Mr. Sperry on this subject.

Mr. Sperry—We have reasons to believe that there are other causes of black heart than cold weather. One is the excess of ammonia. I have been informed that since January, plants have been affected with black heart, but I feel thoroughly convinced that the main cause of black heart is cold weather.

Mrs. Roberts—I would like to know if the pineapple is affected by black heart if it is under cover, or only those that are outside?

Mr. Sperry—Yes. Pineapples have been found to be affected in January and February and sometimes in August and September, and this shows that it is not only cold that causes black heart. I have known parties in Orlando who have found it to a great extent. Our pineries are all under sheds.

Mr. McCarty—Some four or five years ago, during a very hot summer, the Egyptian Queen variety was affected by black heart and has not been affected since. Then it was only the finest varieties that were affected, and they only when there was an excess of moisture. In traveling through the State, I came to the conclusion that excess of moisture was a producer of black heart, where the land is very moist and

there is no opportunity for proper drainage. Black heart is a disease that is caused by a microscopic organism which develops this condition, and moisture has more to do with it than anything else. The season, so far as the moisture is concerned, has nothing to do with it on the East Coast, that is as far as we know. The Egyptian Queen variety is largely affected because it has a tendency to that disease.

Mr. Sperry—We have not been able to characterize black heart as a disease. I do not think it is a disease. I think it is caused simply by the cold checking the ripening process of the fruit which causes the fruit to decompose. What we know as black heart is decomposition of the fruit.

Mr. McCarty—Now, Mr. Sperry says that black heart is a decay due to a factor of some kind that causes decomposition. Decay does not occur without some cause and I think it is a fungus produced by moisture resulting in black heart and causing the fruit to decay.

President—The time has now arrived for the excursion that is tendered us by the Board of Trade. The boat will leave the foot of Laura St. A motion to adjourn is now in order.

Adjournment.

The Society enjoyed the excursion on the Steamer May Garner and visited Cummer's Mill. The Board of Trade did not forget the "inner man" of the members, as they provided an ample collation, which was heartily enjoyed by all.

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## AFTERNOON SESSION.

Wednesday, April 27, 2 o'clock p. m.

President—Ladies and Gentlemen: The next in order on our program is the report of the Committee on Tropical Fruits other than Pineapples, Committee consisting of J. C. Carter, John B. Beach and W. S. Popple.

The following paper was read by the Secretary:

### TROPICAL FRUITS.

*Mr. President, Ladies and Gentlemen:*

Among tropical fruits, next to the pineapple, the most promising for profit in Florida is the mango. It thrives on almost any of our soil which is high enough above water for anything but a mangrove or cypress to grow upon; grows with vigor, and yields with abundance, with a minimum of fertility. It is practically untroubled by insect enemies, and in most localities diseases seldom attack it, and all are readily cured by a simple application of the infallible Bordeaux mixture. It ships quite as well as the orange, even though it ripens in the warm weather, and if we are to judge from the reports from its home in India, it is the king of all tropical fruits. There it has been cultivated and selected for centuries, and holds the place which the apple does in the temperate zone. It is in fact the only one of the native fruits which has been deemed worthy of cultivation, selection and propagation and the perpetuating of superior strains by grafting (or inarching), which is conclusive evidence of its position as the monarch of all. We learn from a report by Wm. Fee, United States Consul at Bombay, that it is shipped successfully to London by

steamer, which shows what a carrier it is; and he further says that the choicer varieties sell for as much as $1.50 per dozen in the home market, when ordinary fruit is a drug at 12 1-2 cents. We have only one variety of the many sorts propagated by inarching there at present in bearing with us, the Mulgoba, and our ordinary seedlings are as inferior to it as a bitter-sweet orange is to the finest budded fruit. Our common seedlings are even marketable at a good remunerative price, with an ever growing demand, hence we may judge what may be the future of the superior varieties, as soon as we are able to place them on the market.

The mango may be propagated by grafting, budding or inarching. But grafting is very uncertain. Budding comes next; and, considering that the tree is rather difficult to move from the open ground and transport at any great distance, without loss, at least of vitality, I have finally returned to the old Indian method of inarching. Even in the case of an old tree, I find it most satisfactory to place a pot-grown inarched tree at the base of the stock, and inarch it. Young trees, newly transplanted trees, or trees that have in any way received a shock, are particularly subject to the attacks of fungus diseases, hence trees transplanted from open ground run a far greater risk. Grafts also run this additional risk, also buds which are slow in starting. This is largely the reason for the partial failure of Rev. Gale's experiments in inarching cuttings planted in the soil beside the stock. Union may be made, but disease gets hold before the new graft has the vigor to throw it off, and as a result the whole tree dies. Regarding the fungus diseases, it is best to spray newly set trees on the ends of the branches with Bordeaux, just as the buds begin to swell before each new growth. It is also well to spray the fruit cluster several times from flowering to maturity, as fungi attack the young fruit and cause it to drop, with an apparent burned brown spot on the side or end, which many attribute wrongly to sunburn. At other times there is seldom need of going to the trouble of spraying, as the ordinary vigorous tree can take care of itself. However, if at any time a tree is observed with many brown or black spots on the foliage, or with new growth coming out sickly, with deformed leaves or none at all, an immediate spraying with Bordeaux is in order. As in the case of the citrus family, rocky hammocks (possibly from excess of nitrogen) predispose the mango to attacks of fungus, while on sandy soils and pine land there is seldom need of spraying. In a general way I may say that the same treatment, soil and culture which suits the citrus family agrees with the mango, except that mangoes will stand more neglect and poorer soil. There are several insects, mostly scales, which I have seen on the mango, but so far none of them have persisted long enough to cause any trouble, nor, except in the case of some sickly trees, which required careful nursing, to require any treatment. I have been experimenting with the propagation of the mango for the past eighteen years, and have had numbers of seedlings grown from seed which I obtained at great expense from the choicest fruit to be found in different parts of the world, and I have yet to find one which produced anything superior to seedlings raised from our native seedlings. In fact, I have come to the conclusion that the same is true of this as of the temperate fruits (only in a greater degree, if anything) that it is useless to waste time waiting for seedlings to bear, but all should be treated as stocks, to furnish roots for the bearing wood of some known tree of superior merits. I have an inarched tree, now planted

two years last fall, which is loaded with fine Mulgoba fruit. Another Mulgoba bud bore at four years old. I have therefore been turning my attention for the past few years to importing inarched trees from India, and have had three shipments of one dozen trees each, embracing the twelve varieties which are propagated there by the Royal Botanical Gardens at Bombay. Out of these three attempts I have obtained the Goa Alfoos and Fernandez, and all the rest have finally died out. Of these, I have the Goa Alfoos inarched on healthy stocks, and these in turn in process of uniting with large bearing trees, also the original importation is now, after two years, showing encouraging vigor. The Fernandez has been here three years, but has not as yet made much growth, being only three feet high, and dwarfing itself each spring by blooming profusely. I understand the Government has succeeded in obtaining a good many of the choice varieties, and trust that before long we will have plenty of propagating wood. With this start I predict that South Florida will soon be known as headquarters for the mango industry, even should Cuba crowd us on pineapples and truck. For the mango cannot be quickly propagated by seed or slips, nor can bud wood or scions be shipped from place to place to advantage, as the most careful experiments have proven to me. The mere fact of the difficulty of propagation will tend to protect us in the practical monopoly of this industry, when once we get our groves established. And the profits which can be expected from this king of fruits, with its enormous yield and splendid shipping qualities, should greatly encourage growers to plant it extensively.

JOHN B. BEACH.

The following paper by Mr. J. C. Carter was read by the Secretary.

**BANANAS and GUAVAS.**

*Mr. President, Ladies and Gentlemen:*

Being on the standing committee of "Tropical Fruits Other than Pineapples," I have consented to open the discussion on the two items of bananas and guavas, as I am too far North to know very much from observation of many of the truly tropical fruits.

BANANAS

grow luxuriantly with us, and, when we have a winter without severe frost, they produce enough fruit the following summer to amply pay for the care the plants require, as they require but little attention after they are set and cultivated one year.

They cover the land with their shade sufficiently to keep down vegetation, and they seem to have the great faculty of fertilizing themselves with the cast-off foliage.

We predict that in the near future there will be large groves of this well known fruit in the lower South, and as they are now so well established as a commodity in our markets, it is not, we think, out of the realm of probabilities that the growing of bananas for market will become a lucrative business.

GUAVAS.

This is another fruit which is becoming an article of commercial value, as evidenced by the shipment from this city of guava jelly in carlots. They grow in about the same latitude as do the bananas, and with about as little care. When once planted, they reproduce bushes without the aid of the owner, and thus appeal very strongly to the average man.

Our members are so well acquainted with these fruits that I feel it would be presumption on my part to enter into the details of growing them. These points I trust will

be brought out in discussion in a manner that will be of more interest than this short paper. Other members of this committee have agreed to handle other fruits, I suppose, and will also help us out on these two, as to their profitableness in the extreme South.

J. C. CARTER.

Mr. Boggs—Mr. President, I will say that from my own experience, I think that Mr. Beach has overestimated the difficulty of transplanting the mango. I have transplanted a good many trees of my own raising and also wild trees and have seen the results. If the mango is taken at its most dormant season, say in January, and if proper precaution is taken in planting the trees, you will have no trouble and the results will be good.

Mr. Muirhead—In regard to guavas, I find that they will grow in our part of the country but must have great care or they will be cut down in the winter by the frost.

President—The next in order is the report of the Committee on Peaches, Pears and Plums, consisting of Messrs. A. C. Haines, A. B. Harrington and D. L. Pierson.

## PEACHES, PEARS AND PLUMS.

*Mr. President, Ladies and Gentlemen:*

It is with reluctance that I attempt to make any report on this subject. So much has been covered in previous reports on peaches, which is the only one of the three, "Peaches, Pears and Plums," that is of any importance in our section, that I can add but little.

I have corresponded with the other members of the committee. Mr. A. B. Harrington, of Winter Haven, writes me that in that section nearly everyone is making citrus fruits their main business, and all other fruits are side issues. The peach industry is on the wane, very few new orchards being planted, and old ones are being exterminated for citrus groves. No effort in pears and plums; very few pears for family use and none in local market. Mr. D. L. Pierson, of Monticello, writes me that that locality is a very poor peach and plum section, though an exception was noted in the Excelsior plum, this being the only variety well suited to that section, so far as the different varieties have been tested, several having been fruited. Excelsior producing full crops every season. Except for common seedlings no peaches of any consequence are grown.

Pears do well in that section, and Mr. Pierson, I believe, has a report for this committee covering pears.

### ESSENTIALS TO SUCCESS.

As to myself, I can only give conditions as they seem to me in the DeLand section. Personally, I have been growing peaches for seven years, and rather making them a specialty, and I feel that I know very little yet about the business. Two things are very essential. First, to grow the very best fruit we can, and then to pick and pack properly. My experience is that medium fruit well packed will sell better than fancy fruit poorly packed. I notice that many writers advise picking the fruit very early in the morning. This will do very well if one has only a few trees, but for orchards of any size it is, of course, impractical. I have been compelled to continue picking all day, and my shipments have, in almost all instances, gone through in good condition—both express and refrigerator freight shipments. As to cultivation and fertilizing, it is unnecessary to discuss, as the ground has been well covered in a general way, in previous reports, and each grower should be the best judge of his individual needs along this line.

As to proper distance for planting, I must take issue with some previous reports. I would not, under any circumstances, plant closer than 20x20 feet, and if little pruning is to be done, 24 or 25 feet each way would be better. I believe trees should be pruned occasionally, if not every year, and in this case would plant 20x20 feet.

As to distance, I speak from experience. My first planting was in the spring of 1897, 12x24 feet. Half the trees were taken out after harvesting the crop of 1900. Later plantings are 20x20 feet, with no intention of closer planting. As to thinning, it is very important and should, of course, be done; but in orchards of any size this is a serious question. With me it is very hard to get the extra help required to thin at the proper time. It is at a time when people are particularly busy with spring orange grove work, putting in crops, etc. I find it easier to get extra help to market crop than to thin fruit.

### THE SAN JOSE SCALE.

San Jose scale is probably pretty well distributed over the State, but has given me very little trouble until I began to spray with Bordeaux mixture, which kills the friendly as well as the unfriendly fungus. I have used kerosene oil with water, fifteen per cent. oil, with little or no apparent injury after trees were with leaf and young fruit, though twenty-five per cent. oil killed half-open buds, and many that were only slightly swollen. Much care is necessary in spraying with oil mixtures, and I know of no pump that is absolutely accurate, or that has proven so with me, and I have used the Deming and the Gould's "Kerowater."

I am not satisfied with kerosene and water and I shall probably try lime salt and sulphur next winter. I have never used crude petroleum.

As to varieties, we grow for early market, Jewel, Bidwell's Early and Suber, with Waldo next in succession, and Hall's Yellow and Angel last. The Rival, introduced by Mr. E. H. Hayward, of DeLand, I consider, by all odds, the best quality peach I have ever seen grown in Florida, though too late for shipment to northern markets, ripening as it does about July 15. It is a yellow flesh peach of good size and color and fine flavor, and for State markets and home use it is valuable.

I do not think we should delude ourselves into the belief that we can have the markets to ourselves up to July 10th or 15th, as it is a mistaken idea that Georgia has no good varieties ripening, until that time. As Florida peach growers know, Georgia begins shipping almost as soon as we do, particularly if our crop is a little late. Indeed, some Georgia shipments were ahead of either my first Jewel or Bidwell's Early in 1901, though our crop was later than usual that year. Their first shipments, such varieties as Sneed, Alexander Triumph, etc., will not sell for nearly so much as our fruit at this time, but, of course, hurts the market. Georgia is not increasing these varieties; on the contrary, they are decreasing, but they have Waddell, ripening June 1 to 10th, and Carman June 10th to 20th, which are very good quality, particularly the latter, which I consider is going to be a very serious competition for us with our fruit ripening at this time, as these varieties sell as well as ours and their production is increasing very rapidly, and there is no use shutting our eyes to this fact.

### THE WORST COMPETITION.

Our worst competition in very early peaches is not in Georgia peaches, but the immense quantity of strawberries on the market at the time our earliest varieties go in, and with largely increased shipments of very early peaches, prices are bound to

be lower. My idea is not to discourage the planting of peaches but to state facts, and I want to say that the profits I figured out on paper have not been realized as figured up to the present time, but I hope that with careful management, the growing of peaches will pay. But one must not look for a bonanza or expect to pay all the original cost and expenses of an orchard in one or two years, or even three, as some articles might lead us to believe.

So far as I know, curculio has not attacked peaches in this section, but for three years they have stung nearly all the plums I have had, and I am fearful that as it increases, peaches will not escape.

THE ROOT KNOT.

Root knot and root gall are both very serious troubles for the peach grower, but I have found root knot more troublesome than root gall. Trees with root gall often grow well and produce good fruit if not also badly affected with root knot, but without doubt root gall shortens the life of the tree.

As for root knot, it is one of the mysteries. Trees affected with it sometimes do well, and others no amount of care or coaxing can make them thrifty. This applies to large trees as well as small ones. Cutting back severely and making an entirely new head will sometimes make thrifty trees out of those affected by root knot, but it will not always do so.

I was able to ship in car loads in 1900, 1901 and 1902, and I much prefer this to shipping by express. With increased acreage over the State, I do not believe that express shipments will continue to pay, unless rates can be reduced, which is not probable.

As to plums, there is no variety that I consider very reliable for our section. I have tried Excelsior, which seemed to promise well, and I am told of good crops on some few trees. I have trees six years old, very fine, large trees, but they have never borne a full crop. Last year I should have had a fair crop but for the work of the curculio. Trees this year bloomed very heavily, but set little fruit. I am trying the Howe, Gonzales and Terrell, but cannot report on any of them yet.

A. C. HAYNES.

**REPORT ON PEARS.**

*Mr. President, Ladies and Gentlemen:*

As a member of your committee to report on peaches, plums and pears, I have been assigned the subject of pears by our Chairman.

I think I am safe in saying that the percentage of profit derived from the growing of pears is as great as that from any of our cultivated fruits. In sections of the State best adapted to the pear, the hill country of the northern and western portion, the trees thrive remarkably, notwithstanding the annual ravages of the blight, and produce good crops about every other year or perhaps two seasons out of three, and a total failure has not occurred in the past fifteen years, to my knowledge.

The introduction of the LeConte from Georgia, about the year 1880 was hailed as the beginning of a very prosperous era in fruit growing in the corn and cotton section of the State, and until 1890, when the blight began its ravages, the prospect was indeed bright.

Thousands of acres were planted to that variety, and the few groves which had reached the bearing age were held as high as one thousand dollars per acre. The fruit sold readily at $1.50 per barrel on the trees, and the crops were very heavy.

Comparatively few among those who planted out the groves were well enough versed in fruit growing to understand the

requirements of the pear as to soil, fertilizer, cultivation, etc., and planted the trees in rich soil, using stable manure liberally.

These overfed trees made wood growth very rapidly, but it was of a sappy, tender growth, and such trees succumbed at once to the blight.

Comparatively few were killed outright, however, but have put on new growth under the let-alone policy which largely prevails at this time, and produce good crops of fruit nearly every season.

The profitable groves at this time are those which receive no attention as to fertilizer or cultivation.

The middles between the rows are plowed for a space of twelve to fifteen feet, in the early winter, and aside from the cutting off of shoots which sprout from the trunks of the trees, no pruning is practiced; hence, I say the percentage of profit in growing pears is high, considering also that the land the trees occupy is not valued at more than $5.00 to $10.00 per acre.

The trees are usually planted about twenty-five feet apart each way, making sixty-nine to the acre. The average yield at this time is about one barrel to the tree, and the price received for the fruit is about $5.00 per barrel net, for the first shipments, to $1.00 for late shipments.

The Keiffer, Smith and Garber varieties of pears were introduced into this State soon after the LeConte, and Keiffer quite largely planted, and the others sparingly.

While the Keiffer is marketed to some extent, it is not very profitable as a fruit for shipping to the northern markets, as it matures at a time when those markets are supplied with a great variety of fruit.

However, it makes a fine canning pear, if ripened properly, and produces wonderful crops of fruit every season.

The farmers in my section are planting the Keiffer quite largely to grow fruit to feed the hogs, and claim it pays them well.

The LeConte is the market pear for Florida, and it is my opinion that the quality of the fruit, which is considered to be indifferent, could be greatly improved by judicious fertilizing and in the selection of proper soils, and as the trees reach fruiting age, by a system of pruning that would let in the sunlight and thus help to color the fruit.

Pears succeed best on land with good but not rich soil, slightly rolling for good drainage, and having a porous or sand mixed clay sub-soil.

In planting a grove on such land I would use a small quantity of high grade complete fertilizer, mix well with the top soil and work in about the roots of the trees. This would give them a good start, to be followed up each spring with a like application, well raked in about the trees, if the growth seemed to indicate the need of it, the object being to get a steady, healthy growth of wood each season.

I would spray with Bordeax mixture before the buds swell in the spring, and repeat at intervals of ten days until three or four sprayings had been given.

I would cultivate the grove sufficiently to keep down grass and weeds up to the rainy season, or plant the land to melons, peas or potatoes.

When the trees begin bearing, say at five to six years from planting, I would begin the use of ground bone and sulphate of potash as a fertilizer, giving a liberal application in early winter, to be well harrowed in after the grove had been plowed, and I would from then on give the land up to the grove.

From experiments along this line I am satisfied we can grow LeConte pears of good size and shape, red cheeked, and of delicious flavor.

Several years ago, after having followed the system of fertilizing as indicated, I

picked a basket of LeContes and, after ripening them in a cool, dark place for about ten days, carried them down town to some of my friends. After sampling the fruit they praised it very highly, and all said they had never tasted better pears.

I am sure we can produce plenty of such fruit, and that properly handled and marketed, it will bring at least $6.00 per barrel crate for the first shipments.

There are in my county, Jefferson, about fifty thousand LeConte pear trees of fruiting age, but many of them are abandoned, along with the poor land on which they grew, made poor in many cases, however, by the process of cropping in cotton and corn long after the trees should have been in sole possession. These trees show great vitality. Blighted, choked with weeds, broomsage and the pine and other trees that spring up in abandoned fields, branches browsed off by the cattle as high up as they can reach, they yet bear considerable fruit each season.

I am fully convinced that many of these groves, that could be bought very cheaply, no doubt, might be restored and brought into very profitable bearing condition.

There were shipped from our station last season twenty-five cars of LeConte pears, besides many small shipments, and the returns were, in the main, very satisfactory. Judging from the lack of care in picking and packing the fruit, the wonder is that the returns showed a profit.

What a great improvement would be a central packing house, with skilled help to grade and pack the fruit.

I thank you for your kind attention.

I am yours respectfully.

D. L. PIERSON.

Mr. Peek—One of the principal reasons of my coming to this meeting was to hear a discussion on peaches and have waited until the reading of the report was over. One special point that I want to bring out is that I find that the Southern countries, as well as New York and other States, differ on the points that I want to get straight on. For example, the Georgia authorities differ from the authorities of Florida in regards to the best cover crop to plant in the summer. I want to know if the planting of cow-peas has a deleterious effect on the peach trees. Georgia authorities say it has not, while some Florida authorities, I think our Mr. President included, say it had a bad effect. I want to get the actual experience of some of the members of this Society who have grown peas and have tried them as a cover crop. I have from twenty to thirty acres that I want to plant in peaches, and I want a cover crop to protect them from the long summer sun. I hope this subject will be discussed.

Prof. Hume—I cannot give any direct experience on planting cow-peas, because I have not planted any, but I do not believe it is the right thing to do. Most of the trouble that has been had along this line is that nearly all peas are very badly affected by root-knot and its attention is soon turned to the peaches, consequently the ground becomes impregnated with the disease. The only cover that you can grow in this State satisfactorily is beggar-weed. Whenever we are asked to recommend a cover, we recommend beggar-weed. It will produce more nitrogen than cow-peas, it will give plenty of seed, and I think answer all purposes satisfactorily.

Member—Would you advise velvet beans in a peach orchard?

Prof. Hume—I have had some practical growers tell me that they are not as good as beggar-weed.

Mr. Mays—I have had no experience in growing cow-peas in peach orchards. Have grown beans for twelve years. Last year

I planted Iron cow-peas without any particular reason.

Member—What kind of cow-pea is the Iron cow-pea?

Dr. Webber—I can explain that Iron cow-pea question as it is one I am familiar with. There are always some plants that are immune to certain diseases and I believe that you will find that the Iron cow-pea is immune to root-knot in Florida. This cow-pea will not transmit this disease to the peach trees if it is grown in Florida. We cannot say that when it is immune in one place, it is immune in all places, but I think that this is a good cow-pea to try.

Mr. Hill—In connection with what Dr. Webber has just said, I wish to say that experiments have been tried and I am of the opinion the Iron cow-pea cannot be depended upon not to transmit root-knot. I would recommend it as a cover crop every time.

Mr. Porcher—I will say from some personal experience I have had, that beggarweed is the best.

Mr. Hart—I would like to know the experience of some of the peach growers in regard to curculio, and if the early varieties are exempt from it. Mr. President, that has given me very little trouble with the late varieties. I have sprayed with Bordeaux mixture, but the leaves begin to drop. This trouble seems to come in rainy seasons.

Dr. Kerr—Out of the fifteen varieties of plum trees that I have planted, the Excelsior is the only one that gave satisfaction, and I have talked with a number of gentlemen who have plums of different varieties and they agree with me on this point.

W. P. Strump—I came here like others, for information. While I am an engineer on the railroad, I am a fruit grower and have a good many kinds of fruit at my home. The question I want to ask is, Do you plant the same distance on poor ground as you do on rich?

Mr. Haynes—I think if the soil is poor, I should try to enrich it.

Mr. Porcher—In Florida, we have nothing but poor soil.

Mr. Peek—From my experience, I have found out, that no matter what the cover-crop is, or what the character of the soil is, rich or poor, it is best not to plant them over 15 or 16 feet.

Mr. Griffin—It would seem that we were overdoing the thing a little by planting 9 by 18 feet and only cultivating one way. The famous Hale orchard in Georgia set most of their trees 13 ft. apart

Mr. Glessen—In Georgia most of our trees are planted 15x15 or 20x20, as then we have no trouble in driving through. By planting 20 feet apart, there is no trouble in turning the cattle into the orchard.

Mr. Griffin—On most of our Florida peaches, we only figure on about seven or eight crops before the tree is done with and we cannot plant our Florida land as we do in the North. The closer the trees are planted, in reason, the better will be the first two or three crops.

Mr. Carroll—I would like to ask this question: Can we plant the peach again on the same land? A good many years ago I planted quite a number of peach trees a long distance apart. After they had grown up, I went in there and planted in between them, and the young trees are now growing well and give indications of a big crop.

Mr. Griffin—I do not advise planting trees on the same ground the second time.

President—The next in order is the Report of Standing Committee on New Fruits and Revision of Catalogue. This Committee consists of H. H. Hume, E. N. Reasoner and W. S. Hart.

## NEW FRUITS AND REVISION OF THE CATALOGUE.

*Mr. President, Ladies and Gentlemen:*

During the past year your committee have received three fruits for description: Surprise Navel Orange from E. S. Hubbard, Federal Point, Fla.; Terrel Plum from G. L. Taber, Glen St. Mary, Fla., and Townsend Mulberry from G. L. Taber, Glen St. Mary, Fla.

The descriptions of these fruits are as follows:

*Surprise (Navel) Orange.* — Form rounded or very slightly oblate; size medium, packing 150—175 to the box, 2 15-16 in. by 2 15-16 in., 2 3-8 in. by 3 inches; heavy, sinking in water, leaving a space the size of a silver dollar not immersed; color, deep orange; base rounded or very slightly flattened; calyx, 3-8-inch across; stem, small; apex navel marked; navel small, 1-8 to 3-8 inch across, rounded, occasionally flattened or protruding as in Bahia, 3-4 inch inside; the rind of the fruit 1-8 inch thick, adhering closely; oil cells prominent and slightly elevated above the surface; sections clearly defined, the dividing septa thin; thirteen in number, variable in size; juice sacs spindle-shaped, small; flesh, fine-grained, yellow in color; juice abundant; acidity and sweetness well blended; flavor, rich, vinous; quality, excellent; seeds, none; season, November-January.

Surprise is an excellent orange, fully equal in quality to the best. It is juicy and heavy. Mr. E. S. Hubbard says the variety fruits better than Hart's Late, even when budded on sour stock. He has fruited it for three years. It must, therefore, be looked upon as a decided acquisition by Florida planters. The variety is distinct from other navel oranges, though occasional specimens resemble the Bahia. No seeds have been found in any of the fruits. It is unreservedly recommended for trial. The bud from which this navel orange originated was discovered among a lot of King mandarin orange trees propagated by Mr. E. S. Hubbard, Federal Point, Fla., from bud wood obtained originally from California.

*Terrell Plum.* (P. tribora; P. Chicasa?) —Fruit medium to large, 1 1-2 by 1 5-8 inches; slightly flattened, rounded and somewhat oblique at the base; light wine color, specked with minute yellowish dots, covered with light, bluish bloom; suture, none, but its position marked by deeper color; cavity of medium depth; stem, short, slender; skin, thin but tough and free from astringency; flesh, yellow, solid or medium, firm; stone, small, flattened, oval, round, 5-8 by 1-2 by 5-16 inch; quality, excellent. Received May 28, 1903, from G. L. Taber, Glen St. Mary, Fla.

A beautiful, bright plum of excellent quality, and one of the few varieties well suited for planting in Florida. It is unquestionably the best variety that has been brought forward for our State. As indicated above, it is probably a hybrid, the leaves resembling those of the Excelsior and totally unlike those of the Japanese plum.

*Townsend Mulberry.*—Size medium, 1 inch by 1-2 inch; oblong, slightly curved; black; rounded at both base and apex; druplets long and narrow, 3-16 by 1-16, not permanent; sutures rather shallow; flavor sweetish, not differing from other mulberries; season early, ripening at Glen St. Mary during the latter part of March and the month of April.

Prolific, trees fruiting abundantly in the nursery row one year from grafting; original scions obtained by Mr. G. L. Taber from Mr. Andrew Townsend, Glen Saint Mary, Fla.

The fact that this mulberry ripens so much ahead of other varieties in North Florida, a characteristic which it will retain, doubtless, in other parts, should give

this fruit a prominent place among the varieties of this fruit.

In preparing the report of the Committee on the Revision of the Catalogue and New Fruits we have deemed it advisable to introduce in the outset some things which may seem to be rather out of place, but which have an important and direct bearing upon some phases of our work, as will develop later on.

We invite your careful attention to the Code of Pomological Nomenclature adopted by the American Pomological Society at its 28th biennial session, in Boston, September, 1903, and we urge upon you the adoption of this code, the best that has been brought forward as the working basis of our systematic pomology, the text of which is as follows:

**Code of Pomological Nomemclature.**

PRIORITY.

Rule 1. No two varieties of the same kind of fruit shall bear the same name. The name first published for a variety shall be the accepted and recognized name, except in cases where it has been applied in violation of this code.

A.—The term "kind" as herein used shall be understood to apply to those general classes of fruits that are grouped together in common usage without regard to their exact botanical relationship; as, apple, grape, peach, plum, raspberry, etc.

B.—The paramount right of the originator, discoverer, or introducer of a new variety to name it, within the limitations of this code, is recognized and empasized.

C.—Where a variety name, through long usage, has become thoroughly established in American pomological literature for two or more varieties, it should not be displaced nor radically modified for either sort, except in cases where a well known synonym can be advanced to the position of leading name. The several varieties bearing identical names should be distinguished by adding the name of the author who first described each sort, or by adding some other suitable distinguishing term that will insure their identity in catalogues or discussions.

D.—Existing American names of varieties which conflict with earlier published foreign names of the same, or other varieties, but which have become thoroughly established through long usage, shall not be displaced.

FORM OF NAMES.

Rule 2. The name of a variety of fruit shall consist of a single word.

A.—No variety shall be named unless distinctly superior to existing varieties in some important characteristic, nor until it has been determined to perpetuate it by bud propagation.

B.—In selecting names for varieties, the following points should be emphasized: Distinctiveness, simplicity, ease of pronunciation and spelling, indication of origin or parentage.

C.—The spelling and pronunciation of a varietal name derived from a personal or geographical name should be governed by the rules that control the spelling and pronunciation of the name from which it is derived.

D.—A variety imported from a foreign country should retain its foreign name, subject only to such modification as is necessary to conform it to this code or to render it intelligible in English.

E.—The name of a person should not be applied to a variety during his life without his expressed consent. The name of a deceased horticulturist should not be so applied except through formal action of some competent horticultural body, preferably that with which he was most closely connected.

F.—The use of such general terms as seedling, hybrid, pippin, pearmain, beurre, rare-ripe, damson, etc., is not admissible.

G.—The use of a possessive noun as a name is not admissible.

H.—The use of a number either singly or attached to a word, should be considered only as a temporary expedient, while the variety is undergoing preliminary test.

I.—In applying the various provisions of this rule to an existing varietal name that has, through long usage, become firmly imbedded in American pomological literature, no change shall be made which will involve loss of identity.

Rule 3. In full and formal citation of a variety name, the name of the author who first published it shall also be given.

PUBLICATION.

Rule 4.—Publication consists (1) in the distribution of a printed description of the

variety named, giving the distinguishing characters of fruit, tree, etc., or (2) in the publication of a new name for a variety that is properly described elsewhere; such publication to be made in any book, bulletin, report, trade catalogue or periodical, providing the issue bears the date of its publication and is generally distributed among nurserymen, fruit growers, and horticulturists; or (3) in certain cases the general recognition of a name for a propagated variety in a community for a number of years shall constitute publication of that name.

A.—In determining the name of a variety to which two or more names have been given in the same publication, that which stands first shall have precedence.

REVISION.

Rule 5.—No properly published variety name shall be changed for any reason except in conflict with this code, nor shall another variety be substituted for that originally described thereunder.

COMMENTS ON THE CODE.

We believe, ladies and gentlemen, that we are well within the premises when we make the statement that no other one State in the Union has a more diversified pomology, and in no other State have a larger number of new and desirable fruits been originated. Every year a considerable number of desirable and meritorious varieties are brought forward. There is no reason to believe that this feature of our work will change; in fact it is not improbable that the number of varieties, particularly of tropical and subtropical fruits, peaches and plums which will be annually brought forward will be in excess of the number that we have had in the past. For this reason we deem it extremely advisable that this Code be adopted and that we ourselves, as a society, conform to its rulings.

Some points in this Code we desire to particularly emphasize: 1st, Rule 2—"The name of a variety of fruit shall consist of a single word."

This rule is extremely important because, eliminating as it does descriptive adjectives and compound names, it has an important bearing upon the reduction of errors in labeling trees, whether in propagation, in packing, in shipping or in planting. Frequently it has happened that where a name consisting of two words has been applied to a variety the two parts of the name have been separated, hence we have the same variety under two different names. The use of a single word gives some guarantee against this and similar errors.

Rule 2.—A: "No variety should be named unless distinctly superior to existing varieties in some important characteristic, nor until it has been determined to perpetuate it by bud propagation."

Adherence to this rule would greatly reduce the number of varieties which have been listed in catalogues and would greatly simplify the work of the systematic pomologist, the nurseryman and planter. There is a natural tendency, in new lines of horticulture, and we would like to emphasize this for the good of our own state, to name everything that is new and different, whether it is desirable or not, whether its merits have been proven or not. As a result of this we have a great many named varieties which amount to little or nothing, and as time goes by the variety, as such, disappears and we have nothing but the name left. Examples without number might be given.

Rule 4.—We would call attention to Rule 4, emphasizing the point that every published description of a variety should be dated. If it is published in the reports

of societies, horticultural magazines or papers we are certain of its being dated; but where separate sheets, describing and setting forth the merits of a variety, are issued, it is occasionally omitted. When this is done it interferes seriously with the history of varieties.

CATALOGUE.

We would now invite your attention to the catalogue itself. In making it up we have followed the general scheme as laid down by those who have had this work in charge on previous occasions. We have adhered to the same sets of explanations and abbreviations, but in one or two cases we have changed the classification somewhat. For instance, we have separated the mandarin oranges from the sweet oranges, placing them in a group by themselves; similarly with the bigarabade. The pomelos and shaddocks we have also separated, because we do not believe that the inferior fruit should be associated with the new and desirable one, which has become so important in our State. With the grapes we have pursued a similar policy, and deeming it advisable to list the Muscadine grapes by themselves, have done so. To the sweet oranges we have, as yet, added no variety. One variety, the Surprise navel, will undoubtedly find a place in our list, but we do not believe the time has come for it to receive recognition in this way until it has been fruited over a wider portion of the State. To the Mandarin oranges we have added Oneco; to the pomelos, Duncan, Hall, Indian River, Pernambuco and Royal. To the limes we have added Rangpur, and to the citrons, Corsican. To the peaches we have added Dorothy, Hall and Victor; to the plums, Howe. Terrell should be added, doubtless, but it would perhaps be preferable to have it tried more extensively first. To the figs we have added White Adriatic; to the bananas, Dacca and Martinique; to the guavas, Guisaro and Guinea. The whole mango list we have abolished, substituting therefor the single variety, Mulgoba, to which many others will be added, doubtless, within a few years. To the miscellaneous list of minor tropical fruits we have added the following: Downy Myrtle, Indian Fig Cactus, Tuna Cactus, Carissa Arduina, Kei Apple, Akee, Barbadoes Cherry, Limeberry, Casimiora edulis, Anacardium occidentalis, Grandilla, Egg fruit, Monstera, Sapota blanco; and we have transferred the Surinam cherry to this same list.

From the pecan list we have removed Paper Shell and added Schley and Vandeman. To the walnuts we have added Juglans cordiformis.

Now, directing your attention to the catalogues which have been distributed, we shall carefully go over with you the list of varieties which we deem it advisable to strike from the catalogue. Many of these varieties have disappeared entirely, while others have not proven satisfactory, or have been superseded by better ones. We deem it advisable that they be omitted. If at any future time they again become prominent, they may then be reinserted. We do not believe it advisable to have our catalogue contain anything except a practical working list of desirable varieties. It may be, however, that some of you will take the view that the catalogue, as such, should contain all the varieties which have ever been brought forward; but your committee has taken the view that the catalogue should contain practical facts for the practical man. It is at the present time the most important source of information on these matters that we have.

Respectfully submitted,

H. HAROLD HUME,
E. N. REASONER,
W. S. HART,
Committee.

Following the reading of the above paper, the question of revising the Catalogue of Fruits was taken up and considerable time spent on same. The revised Catalogue will be found under the caption Catalogue of Fruits at the close of this volumn. All of the discussion in regard to this Catalogue has been left out, with the exception of such remarks as contained information that might be of service to members of the Society who were unable to be present.

## DISCUSSION.

### Limes.

Prof. Hume—Getting down to limes. The name Mexican does not stand for anything. We have plenty of these limes growing in different parts of the State but the name Mexican applies to seedlings. Does anyone in the audience know the Persian?

Member—Mr. E. S. Burley of Tampa has a lime which he calls the Persian lime. It has a distinct lime taste, but is a little smaller than the Mexican.

Mr. Boggs—I set out three hundred trees of Persian limes. They are low trees with their limbs spreading over the ground like the Citrus trifoliata.

Mr. Blackman—I think that there is a good deal of difference between the two varieties, not only in the growth of the tree, but in the shape of the fruit; one is oblong and the other is round, but the flavor of the fruit is very similar.

Mr. Conner—I would like to mention that I have planted both the limes and I find that they are identically the same. I do not believe there is any difference in the two varieties. The fruit is about the same in size and color.

Prof. Hume—I had a sample of both these varieties in my office, and I called the attention of a gentleman from the North to the similarity of these two limes, and after a close examination, he was of the opinion that they were entirely the same, but the little difference in the growth of the tree and the shape of the fruit might have been due to the locality in which it grew.

### Plums.

Dr. Wiley—I would like to say in favor of the Howe plum, that this plum was introduced in Tampa and has promised to be very satisfactory and many of the planters have put in a great number of these trees. This variety seems to hold the fruit remarkably well.

### Apples.

Dr. Webber—What have you done with apples?

Prof. Hume—I never ate an apple grown in Florida that was any good. Some can be grown in West Florida satisfactorily.

### Grapes.

Mr. Boggs—There is one candidate for entrance on the list of grapes which I think very highly of, not only as a propagator, but a good variety for home use in the extreme southern part of Florida. It is a grape of the European type, supposed to be a Scuppernong, and I think it should be included on this list of grapes. It is known as the Key grape.

Prof. Hume—May I ask if this grape has been propagated as a variety?

Mr. Boggs—Yes, it has been propagated and has been found extremely profitable. It will bring 20 cents per pound.

### Oranges.

Prof. Hume—The Mandarin oranges will all be taken out of the list. The China, Satsuma and Dancy will be placed in a class by themselves.

Mr. Hubbard—I fail to see sufficient reason for taking the Mandarin out of the orange list. They are all oranges, simply a different variety so why should they be set apart?

There are two varieties of oranges here, I would like to ask about. The Double Navel is not stricken from the list and I do not see a good reason for keeping it there. It is a poor bearer and the fact of its remaining on the list might induce some grower to try it and be sorry he did so. I think it would be well to leave on the Fortuna. I am growing quite a few of them myself and they have proven very satisfactory. It is a very sweet orange.

Mr. Gardner—I would like to know the experience of some one who has grown Boone's Early. They begin to dry up about the 1st of December before they turn yellow.

Mr. Pettigrew—I have some half dozen of Boone's and we begin to gather them in December.

Mr. Wait—Mr. Strong told me that he had been growing that orange for several years and that the fruit the last of September and through October was well grown and thoroughly colored and was much more satisfactory than the Parson Brown.

Mr. Hart—My experience with the Boon's Early is that the oranges color up early and have to be picked early or a brown spot comes on them. The tree does not look as healthy as some others, but it grows well and the oranges are all sweet. Some authorities claim that the Parson Brown variety is sweet early in the season and will hang on the tree without dropping until quite late. It is a very satisfactory fruit.

Mr. Wait—The flavor of the Boone's Early is very distinct. It is of good color and that is what seems to strike the buyers.

Prof. Rolfs—I think the rule that the Georgia Horticultural Society use, that no fruit is to be listed until it is offered for sale, is a good one.

Member—I would like to amend that rule to read, that no fruit could be entered on the list until it has been offered for sale.

Prof. Hume—What do you mean when you say offered for sale.

Member—I think it would be well to have it that no fruit should be named until it had been grown satisfactorily by some member of the Horticultural Society.

Mr. Porcher—There are some fruits that are propagated in certain sections and are very good in these localities and will be named whether the Society agrees or not. When a new fruit is offered to the Society, it is expected to accept it and in this way we might have one fruit on the catalogue under two names, the only difference being one growing in one part of the State and the other in the other.

Prof. Rolfs—I agree with ———•— in the matter and I certainly think that some amendment should be made to this rule.

I offer the following resolution:

*Resolved*:—That no name shall be placed in the Catalogue of Fruits until the variety has been propagated.

That motion was made and carried.

President—Now, Ladies and Gentlemen, we are ready to hear the report of the Committee on Citrus Fruits. The Committee consists of Messrs. G. S. Hardee, F. G. Sampson and M. E. Gillett. Is this Committee ready to report?

Mr. Porcher—The question has been raised as to how long we can hold oranges on the tree. This is an Indian River Orange, (holding up an orange) and has been off the tree about three days. You can see that it is in perfect condition. My belief is that if the land is not overcultivated and not too much fertilizer used, the fruit can

be held late in perfect condition. On land similar to mine, if the land had been heavily cultivated, we would have no fruit now

Prof. Hume—Was it grown under cover?

Mr. Porcher—No Sir. This was grown in the open air.

Member—How much potash was used?

Mr. Porcher—Not more than about 12 to 15 per cent.

Mr. Boggs—I would like to ask some of the well posted growers of the Society, what would be a fair estimate of what portion of citrus raised in the State would be grape fruit and what oranges?

Mr. Brown—In my estimate the proportion of grape fruit amounted to 25 per cent. and oranges 75 per cent.

Mr. Wait—For the coming year?

Mr. Brown—No, for the past.

Mr. Hart—As matters seem to be going a little slow, I would like to make a few remarks. If the orange and grape fruit growers of Florida would produce a few acres of good oranges and grape fruit, instead of several hundred acres of poor fruit, it would be a great deal better for all concerned. The imports into this country of better fruit than is sent from the States, is hurting the price we are now getting for our fruit. I do not say that there is not good fruit raised in Florida. No, the very best of oranges, in fact all citrus fruits, come from Florida, but if every grower would raise good fruit and let no poor oranges go out of Florida, look at what good prices we would get for them. In my opinion it is a great deal more profitable to have one grove of first class fruit bringing the highest prices than six groves of poor, small fruit bringing low prices.

Member—I would like to ask Mr. Porcher, if he finds that the rough lemon will hold its fruit as long as it will on the sour stock. Do you cultivate or is it noncultivation that produces the quality of fruit we see here?

Mr. Porcher—I experimented with 200 on rough lemon; 100 of these were put on low ground, the other 100 were planted on scrub land; in both cases the trees were budded with the finest orange. On the high ground the rough lemon seemed to work very fairly. On the low ground I lost 40 per cent. of the trees from the root rot. The leaves turned yellow, and the roots rotted off. I resolved that I would not plant any trees on any soil on a rough lemon stock. I have some land that is pine on which I have grown some very fine fruit. Mr. Hart and I represent two distinct methods of fruit culture. He is absolutely opposed to spraying and I absolutely believe in spraying and I am convinced that of the two groves, it would be hard to find on which is the finest fruit.

Mr. Wade—I would like to ask what is a good formula for fertilizer for a grove.

Member—A good formula is ammonia 4 per cent. phospheric acid from 7 to 8, and potash 12 to 15 per cent.

Mr. Wade—From my own experience I find that too much potash in a fertilizer will make the fruit too acid and the most of our ready-made fertilizers have 12 per cent. Some of my fruit was very acid and I could not make up my mind whether it was due to too much potash or to other causes.

## EVENING SESSION.

Wednesday, April 27, 7:30 p. m.

President—Now, Ladies and Gentlemen, there is one thing that I have to bring before your attention before we take up the regular order, that is in connection with the affairs of Mr. Powers. I think there should be a Committee appointed to look over the books and papers that belonged to the Society and to get to a basis of settlement with Mrs. Powers. I think it would be better to have a Committee appointed to act as an Auditing Committee, with Mr. Frink as Secretary. I would like a motion to that effect. I think it would be better to have our Secretary as one of the Committee, because he has those affairs in hand at the present time.

Messrs. Aubrey Frink, E. O. Painter and Mr. Brown of Manatee are herewith nominated by the House as members of this Committee.

The motion is seconded and carried.

President—This Committee will try and make out a report before the close of this meeting.

Prof. Hume—Mr. President, I think that at this point, in order to simplify matters and to finish up the business and get through by tomorrow night, it would be well to appoint another Committee on Final Resolutions, and I move Mr. President appoints the same.

President—You have heard the motion?

(The Motion is herewith seconded and carried and the President appoints on this Committee Prof. Hume, Dr. Richardson and Mr. Hubbard.)

Prof. Hume—I only got through one-half of what I was going to say. It has been our custom, many years back, to appoint a Committee for the nomination of the officers for the coming year. I think it best to follow that rule. I make a motion to the effect that a nominating committee be appointed by the Society for the appointment of the officers for the coming year.

Mr. McCarty—There are times, Mr. President, when perhaps it is best to digress a little from the ordinary course of business, and I feel at the present time as though this should be done, in order to inform you that we are about to lose from our organization one of our most active and esteemed friends in the Horticultural Association; we are about to part with one of our leading horticulturists in the State—one of our brightest young men—and advancement and it is but right that he should avail himself of the same. We are about to lose Prof. Hume. No one regrets it more than myself, not only because of the strong personal friendship still we should express our gladness at his that has grown up between us, but I know the loss to our Society. I now feel that the Society is called upon to record this in their report, and I wish to have this memorium to go in our report.

*Resolved,* by the Florida State Horticultural Society in convention assembled, That in the removal of Prof. H. Harold Hume from our State to other fields of labor and accomplishment the horticultural interests of the State will suffer a distinct loss; that during his 5 years of untiring effort in the advancement of the horticultural progress of the entire State, he has accomplished much of permanent value, has enriched the literature of the State, has endeared himself to the masses of our people

and has ever been cheerfully and successfully responsive to the call of duty. We desire to testify to his sterling character, high ability, deep research and uniform success in all his undertakings. Regretting his loss to the State of Florida, we predict for him greater measures of success in the wider work to which he has been called and to which his marked ability has made him eligible.

The motion was carried unanimously and the remarks of Mr. McCarty made a part of the report.

Prof. Hume—Allow me on this occasion to express my appreciation of your feelings in this matter. I cannot make a speech without being prepared, but I thank you.

President—Is there any more business to come before we take up the regular order? We left off with a discussion of Cittus fruits and will now proceed to take up the Report of the Standing Committee on Diseases, Insects and Methods of Control, consisting of Messrs. F. D. Wait, H. A. Gossard, P. H. Rolfs, Dr. F. W. Inman, W. S. Hart, C. W. Butler, E. H. Mote.

## DISEASES.

*Mr. President, Ladies and Gentlemen:*

As chairman of your committee to report on Diseases, Insects, and Method of Control I wrote to several members of this committee, but all, like myself, were too busy then to make a collective report, and it seemed to be the wish that all should report separately.

While I know a great portion of what I shall say may not interest the old growers of citrus, as they have heard it year after year, yet to some new members of this Society it may assist them in handling some of the many diseases and insects that the Florida orange grower sooner or later comes in contact with.

### FRENCHING.

We have found that the disease known as Frenching, or French leaf, has been caused in our groves by sourness of the soil in some instances, and character of soil in others, where it is close and compact. Our remedy for these spots, is to drain those affected with sourness, and apply to both one pail of air-slaked lime in November, to trees capable of holding one box of fruit. Hoe in lightly. This sweetens the sour ground and loosens the hard soil. Mulching also will assist the latter.

### FOOT ROT.

Stock most affected, sweet and rough lemon. The sweet stock gave us a great deal of work four years ago. We have used one part of sulphur and two parts lime or land plaster (we prefer the lime) by thoroughly mixing both together and applying around the base of the tree and crown roots, after removing the earth from the top of same. This is done twice a year, and we do not have to hunt for foot rot, as we have had none for the last three years. We have the rough lemon stock mixed all over our young groves, and occasionally we notice a tree turning yellow. On examination we find the entire root system has become diseased and the bark has turned brown upon them, and in most cases sloughed away. As this has been less than one-half of one per cent., we did not think it necessary to sulphur the entire groves, and have only confined that treatment to the old sweet seedling portion.

### WITHER TIP.

Prof. Rolfs pointed this out to me about two years ago. It was on a portion of our old grove situated on Terra Ceia Bay, and we have noticed that when we have had hard northwest winds for a week from across the Bay, our trees shed the leaves

from the fruit wood, and it soon died back. Whether salt spray was the cause, or it hastened development of wither tip I am not able to say. The trees had never been pruned out inside (as most groves are in that section). Last spring we pruned out all the inside wood and water-sprouts, and today they are in a healthy condition, with a good crop of fruit set.

SOUR BLIGHT OR SCAB FUNGUS.

Last season I noticed one of our grapefruit trees coming out with a new growth, which was covered with this blight. There was very little blight noticeable upon the fruit. This season I found several others situated in different parts of the grove.

There are some signs of it upon the tree affected last season. Several years ago I noticed that where limbs from a sour tree extended through the limbs of a budded grapefruit in the nursery, the latter would sometimes develop this blight, but when transplanted, or the sour stock budded and the top removed, it would disappear. Specimens were sent Prof. Rolfs and he reports that he found two kinds of fungus, the scab and wither tip.

LIMB BLIGHT.

This attacks the old sweet seedlings. The first indications that we notice is during the first growth in the spring. It becomes very conspicuous in not starting. Sometimes it will only show on one limb, and then again the entire tree has a dull, stunted appearance, and after showers will invariably wilt as from a drouth. It will stand in this condition six months, more or less; then the leaves begin to dwarf at the top and shed, leaving the fruit (if any) to stand out in bold relief. If there is vitality enough in the wood, this fruit will mature the last of September, and is sometimes shipped on account of its color. It usually runs 200's to 250's in size. As the tree dies at the top water shoots will start in the inside. Prof. Rolfs made two visits to our groves in 1902, the first time taking specimens of root, trunk, limb and twig, and the second bringing back cultures, to see if he could inoculate a young, healthy seedling, and some of the old healthy trees, isolated from those diseased. He has written me that in the limited time he has had from other work, to study this disease, he has made some progress. I have not yet noticed any change in the trees inoculated with the limb blight spores. I am experimenting with the old stumps that we remove from time to time, but I can at present only recommend to others the same method that Prof. Webber gave us years ago, that is, remove the trees as soon as possible, after they develop the above characteristics, and burn them, filling the holes with fresh earth, and plant other trees in their places; but do not use a sweet seedling root under any consideration. We have one hundred large seedling grapefruit, from twenty to thirty years old. Some are in rows by themselves with seedlings on each side, and others are among the limb blight trees. I have never noticed the slightest indication of limb blight among these trees. We have nineteen large lemon trees budded on the rough lemon and sour, which stand among these diseased trees, none of which have shown any signs of it.

DIE-BACK.

Die-back may be caused from clean culture extending too far into the rainy season, plowing too close, lascerating the crown roots, feeding the trees with organic fertilizers too high in ammonia, plowing too deep and forcing the root system into a sour sub-soil. From one to three sprayings of Bordeaux mixture will always bring them out, unless the cause is continued. After using Bordeaux, it is necessary to follow it up with thrip juice or strong pot-

ash soap emulsion, within thirty days from each spraying. A thick mulching of grass, weeds, or any trash, will in one year's time cure the disease, providing no culture is pursued for two years thereafter.

### GUM DISEASE UPON THE LEMON.

On our low hammock lands this is the worst disease we have to contend with in growing lemons. They have periods of gumming just above the point where bud was inserted. This extends up from one to three feet. We have made a wash of sulphur and lime and sprayed the trunks once in six months, and seldom lose a tree; but it injures the tree and fruit, showing up sometimes in little reddish-brown spots upon the peel when curing. I understand they have the same disease in California. Prof. Rolfs, in his bulletin No. 52, attributes this spotting of the lemon to wither tip. A copy of this bulletin should be in the hands of every citrus grower, as this disease was first known to exist in Florida in 1886, but now it is present in every citrus growing region.

### INSECTS.

If the season is dry the purple mite will begin to show in January and February, the thrip at blooming time, chaff scale and mealy bug during the rainy season, turtle back and the long red scale usually make their appearance the last of September and October. The red and long scale will change the appearance of the grove and speck the fruit in two weeks' time, so that it will be almost impossible to clean the fruit or trees before the new growth starts in the spring. In our section, where we must have bright fruit in order to sell it early, it is necessary to spray for the rust mite, and unless we use thrip juice or strong potash soap alternately, we will have scale galore in October. Where soft water is available it can be combined with the sulphur solution and thrip juice, and used up to the middle of July, at which time the thrip juice should be discontinued, on account of its neutralizing the acid of the orange and making the juice insipid. We use three quarts of the sulphur solution for purple mite, five quarts to fifty gallons for red spider. Two sprayings are usually sufficient. We use the kerowater for mealy bug. One thorough application of ten per cent. kerosene will kill nine-tenths of them, and one more spraying, where any are left, will suffice. Good's caustic whale oil soap No. 3 will kill the thrip and chaff scale. I have never seen any damage from the turtle back scale, except that it will precipitate a honey dew that will be attacked with the sooty mould; but it soon cleans up and seldom affects the same tree two seasons in succession. In budding low, or grafting the orange, we are sometimes annoyed by ants and wood lice girdling the trees, but have found that one part of creoside to forty parts of water, sprinkled around the stumps or nests, will kill all it hits and drive the others away. I think this is the best remedy I have ever used. This creoside can be purchased of the Sanitas Co., limited, 636 and 642 West 55th St., New York City. Costs 88 cents per gallon.

Grasshoppers sometimes eat the foliage of the trees when grass is allowed to grow too near the small trees. Hoe away the grass, and spray with Paris green. This will kill the grasshoppers, but care should be taken that all kinds of stock are kept from nibbling these sprayed trees.

### WHITE FLY.

Groves that we sprayed during last October with resin wash and Good's soap have cleaned up and very few white fly were in evidence the first of March. Those we sprayed in December and January did not do so well. There were heavy fogs and dews that kept the trees wet until ten or

eleven o'clock each day. This moisture no doubt counteracted in a measure the effect of the spray. The summer and early fall was dry and the brown and red fungus only developed on the bottom limbs; but I noticed that after spraying it began to work up higher, and when there were rains and fogs in November, it soon spread to the tops of the trees. We have just sprayed the grove with sulphur solution for the red spider. While we may kill all of the fungus, we have killed the red spider and feel sure that the fly has also been hard hit, as they are off the wing at the present time. To fight this fly, we should have a deadly dust to spray with in damp weather, and Good's soap, resin wash or a strong sulphur solution in dry weather. The resin compound is also good, but much more difficult to make, and is troublesome in clogging the nozzles. Otherwise it would be much cheaper than either of the others. I believe it is the duty of every grower to spray and hold this pest in subjection.

I have made some experimental work with the Jumbo dust gun, but found the machine was not strong enough, and we were annoyed with its clogging. While the results were fairly satisfactory, I cannot say I am satisfied. Mr. Chase, of Sanford, has purchased a larger power dust sprayer, and writes me that he is more than pleased with it. He believes two men can dust forty acres in one day.

The power spraying machine that we are now using does the work of two hand outfits, throwing 1800 gallons per day. It requires one heavy pair of mules to draw the outfit. Four lines of hose are used. One man attends to the pump and engine. Capacity of tank, 300 gallons; pressure used, 100 pounds.

There are a few suggestions I wish to make before this meeting, and would recommend that our Society, as a whole, petition the railroads to pass all professors of our experimental stations when on tours of inspecting diseases and insects damaging the fruit and vegetable industries of this State. Also to carry free of charge all specimens for laboratory work. The railroads should be just as much interested in this work as the grower or the State of Florida.

I am told that these expenses would allow more help in the office and give the professors more liberty to study in the laboratory and field. The question of blight itself will certainly lose to the roads many thousands of boxes of fruit, unless more vigorous work is accomplished. Two men should be kept on this one line of work, and I think the Agricultural and Horticultural Departments at Washington should be asked to send these men or others to assist those now on the work.

It may seem a little out of place, but I would like to ask a question, why this State cannot afford to pay as much as other States, and hold out inducements to the professors now employed in our Experimental Station, that they may be satisfied to co-labor with us. I believe that every member will agree with me, that in losing Prof. Hume, this Society and the fruit and vegetable growers of the State of Florida are being deprived of a most valuable man. We have others who may at any time have more flattering offers made them, and I think it the proper time to take some action that will keep these experienced men with us.

F. D. WAIT.

## DISEASES OF CITRUS TREES

*Mr. President, Ladies and Gentlemen:*

To a body of people like the Florida State Horticultural Society, it is superfluous to rehearse the way in which science benefited the art of Horticulture; still, it pays at intervals to stop and take stock, as it were,

*Paste this on Page 57.*

## ERRATA.

The title of the address given as "Diseases of Citrus," occuring on page 57 should be changed so as to read "RELATION OF SCIENCE TO HORTICULTURE;" being a general resume of the present status of important questions concerning citrus growing, discussed from a scientific point of view.

or rather like the explorer in a distant country, who sits down from his arduous labor of traveling, in the beneficent shade of a spreading oak to examine his compass to understand more fully at what point he has arrived and what course he should pursue in his further progress.

We pause at intervals in our labor, which we call our annual meeting, to take stock of what we have in trade, of what our art is doing and what we intend to do in the future. We have here met as partners in one great corporation, to place before the stockholders the results of our labor during the past years. By the sharp criticism and free exchange of ideas we are enabled to correct our mistakes and to praise each others triumphs.

Horticulture is an art which has for its field of study, plants that are used for beneficial purposes. Botany is a science which has to do with the systematizing of our knowledge of plants. In passing allow me to remark that science is a much maligned and abused word. Those people who use the term most, and prate most about it, are apt to be in need of all the advertising they can get. It is almost a certain sign to find a school or individuals who know least about the matter, talking most loudly of the scientific attainments. Science, as a matter of fact, means very little, some one having tersely remarked that "Science is merely systematized common sense." In reality that is all there is to the matter. In manner science is modest, even retiring, and until quite recently it has been but little used for commercial advantages. For many years it was even considered dangerous to ones moral character to be well informed scientifically.

The science of plants called Botany, is the result of a vast amount of work wrought into a systematic scheme. Latin and Greek names, which are so often the "bug-a-boos" to frighten people, are merely a necessary and unavoidable means for handling the subject. As soon as we study any subject earnestly, we find that certain terms must be employed to express our ideas. The question of shortening these terms becomes one of paramount importance, and for scientific purposes it becomes absolutely necessary to have certain expressions which have attached to themselves a definite meaning. No sooner are we launched into the subject fully than we find that the terms used by our predecessors are either erroneously understood, or have attached to themselves meaning which are inadequate for the present use; hence we must coin certain terms with which to express the correct and desired idea. This is the case in every field of labor, whether it be law, letters, history, science or horticulture. Every one of us understands perfectly what is meant when we speak of dieback, of potash or of Bordeaux mixture. Yet to many of our horticultural friends who labor under different conditions, these terms are as incomprehensible as any Greek or Latin word could possibly be.

Originally, the term horticulture was restricted to the propagation and cultivation of those plants which are either grown for ornamental or culinary purposes, excepting such plants as were grown under field conditions. The boundary and limitations between horticulture and agriculture is purely artificial and must be decided by the section of the country which has the dealing of the matter. Even in our own country we find that sweet potatoes are considered as a horticultural crop in the northern states, while in the South they are placed among the agricultural productions. It is hardly necessary to multiply these illustrations. Dr. L. H. Bailey in his Cyclopedia of Horticulture, says that "Horticulture is a

composite of botanical and agricultural subjects, but horticulture is more than all this. Plant forms and plant colors are as expressive as the canvas work of the painter."

In looking over the titles of our program, we see that the Florida State Horticultural Society has acted wisely in not limiting itself to an artificial boundary, but has taken the whole range of subjects—applied chemistry, entomology, pathology, soils, fertilizers and what was formerly included in horticulture.

The foundation necessary to be a well trained horticulturist is as broad as science itself.

## FERTILIZERS.

While citrus growing was in its infancy in Florida and during the developing period it was generally agreed that the hammock was the only land upon which a grove should be planted. This belief was so thoroughly ground into every one that it took considerable time to dislodge the idea. Let me hasten to assure you that I do not wish to discount the value of hammock as a location for citrus groves. It is a matter of fact that some of the very finest fruit grown is taken from groves located on hammock land. As a rule, new hammock land requires a smaller amount of fertilizer than the ordinary pine land. We have, however, grown in experience since the time when we believed this kind of land to be the only place to grow citrus. As evidence of this we may cite the number of very extensive groves which are producing as fine fruit as ever found its way to market, on pine land. A census of the orange groves at the present time reveals the fact that by far the largest acreage of groves occur on pine land.

In the early days, when transportation facilities could be had only into the northern margin of the citrus region, the matter of location was of very first importance. The hammock, with its native fertility and sheltered conditions, naturally had to be chosen.

The first attempt at grove fertilization, and what we may call the most primitive, was what is generally known as cow-penning. The mere term is so familiar to every orange grower that it is entirely superfluous to do more than merely allude to it. During the days when oranges were curiosities in the market and had to be hauled for miles over saw palmetto roots and oak runners, this kind of fruit found a ready market. The thick, rough skins formed a very good cushion to take the blows which resulted from driving the wagon over palmetto roots and oak scrub. The abundant rag in the fruits prevented them from being pounded to pieces, so that the product, which in former days could be gathered with a club, and pounded over palmetto roots, found ready sale, while at the present time it goes begging. A small quantity of penned fruit is still being produced, but it amounts to a small fraction of the entire crop. Even the fault-finding tourist whom we occasionally meet, who growls at the "pits" in the oranges and complains because the skin is so thin that he can't take it off without getting "juice all over his hands," soon learns that the orange raised on chemical fertilizer is possessed of an aroma and flavor which can not be secured in the heavy pulpy fruit of our penned groves. The information that chemical fertilizers produce superior fruits is penetrating "the islands of the sea." The following quotation is taken from the West Indian Agricultural News, published at the Barbados. (Agricultural News III: 100.)

It is a well recognized fact in Dominica that the use of pen or stalk manure for

citrus trees results in increasing the size of the fruit at the expense of the texture. Limes manured in this manner approximate to lemons, while orange trees similarly treated bear fruit of enormous size with very thick skins, woody pulp, and very little flavor. Until quite recently it never occured to me that this was not an established fact throughout the West Indies; but from something said to me the other day by a resident in a neighboring island, it appears that it may not be so. It would be of great interest to planters in this island, to learn whether this result of the use of pen manure has been noticed by orange growers in other islands; and if so, what manures they used.

The use of organic ammonia in bearing groves is practically a thing of the past and fruit growers are united in recommending and using high grade sulphate of potash. Dissolved bone is rather an expensive chemical, while the accidulated rock which is not infrequently called dissolved bone, is much cheaper, so that it becomes a question for discussion if there is not more money in buying the cheaper form of phosphoric acid than the more expensive dissolved bone. We have been told repeatedly by reputable chemists that there can be no possible difference in the use of the two, but good orange growers insist that there is a difference and that the difference is in favor of the use of dissolved bone. The probability is that the genuine dissolved bone will sooner or later have to be dropped from the market on account of the limitation of the supply and the high price of the product. We find therefore that the question of the use of fertilizers in connection with citrus trees is one that has been fairly well settled by this time.

The greater part of Florida soils are so sterile that the fertilizing constituents contained in them naturally may be neglected. We may consider it as merely a medium into which plants force their roots and are held into position. That soil is merely a convenience, or convenient medium used to hold plants in an erect position has been demonstrated repeatedly. It is by no means necessary to the health and well being of a plant to have soil at all. The following quotation from a recent number of The American Fertilizer, is more or less of a summary of what has been done in growing plants in the absence of any soil at all. (The American Fertilizer XX.; 16.)

"The greatest of all Professor Nobbe's work is his remarkable discovery of a method for inoculating the soil with bacteria to make it yield richly where it lay barren before. In time past investigators of soil and plant culture devoted their attention largely to studying the composition of various kinds of soil, to the improvement of fertilizers, and in suggesting new systems of drainage and water supply. Professor Nobbe has gone a step further in advance, declaring that plants will grow, under certain conditions, just as well without soil as with soil. At first glance this may seem strange enough. Yet here are trees from 8 to 10 inches in circumference at the base of the trunk, growing in clean water without a sign of soil of any description. They stand in rows just back of the Forest Academy, and near Prof. Nobbe's greenhouse. Each tree is suspended in a large glass jar surrounded by a green painted case. When this case is opened, one may look through the glass and see the roots of the tree hanging there in clean water. The oldest of the trees was planted, or rather the seed was immersed

in water, in 1878, and it has grown to full size without even touching soil. Leaves and blossoms have come in the spring, and in the winter the water and roots have frozen solid all these years, and the tree still thrives. Indeed, some of its seeds were immersed in water, and trees of the second generation have been grown to considerable size, then their seeds were immersed and there are now growing small trees three generations removed from the soil—certainly a clear proof of Professor Nobbe's assertion that actual contact with the soil is not essential for plant growth. In order to produce such results, however, it was necessary to keep the trees supplied with artificial food. This Prof. Nobbe prepared in his laboratory—a certain definite amount of chlorate of potash, sulphate of magnesium, phosphate of iron and phosphate of potassium, and a nitrate. A small quantity of this mixture was dissolved in the water of the jars every four weeks, and thus the trees have been kept flourishing all these years, showing that there was no element in the soil necessary to plant growth that man could not manufacture at will."

In the earliest days of study in connection with the composition of soils it was thought strongly probably that by making a careful chemical analysis, it would be possible to ascertain just what elements were present in sufficient quantity and also what ones were wanting. Indeed we do not have to seek to find direct statements to this effect by credible workers. This idea has proven to be, however, entirely inadequate. We know from actual experience that a trace of nitrogen, potash and phosphoric acid added to the soil will frequently double or treble the quantity of the crop. This amount of fertilizer, when added to the soil, is relatively so small that it is not measured chemically. Suppose we do add 200 pounds of potash per acre; we have not in any perceptible way added to the bulk of soil in this area. Now if 200 pounds of high grade potash be stirred into the soil, we have this quantity mixed with probably two million pounds of soil. It would mean that we have added only about one ten-thousandth part, or possibly one-millionth part, to the portion of soil penetrated by roots, and while this amount would be considered a heavy application for ordinary crops and would be shown by most decided increase in product, it is so comparatively small a quantity that it can only be estimated by the crop growing on the soil, so that we must abandon the idea of being able to tell by direct chemical analysis whether a sufficient amount of plant food actually exists.

## INSECTICIDES.

About 20 years ago, scale insects were considered the greatest enemies of citrus groves in Florida. The difficulties were both real and imaginary—very largely the latter. In many cases they were credited with doing work for which they were not in any way responsible. It is certain that the methods of warfare were exceedingly crude and often ill-advised. Later our veteran friend, the late Mr. Henry G. Hubbard, discovered how to compound a mixture of kerosene and soapsuds in such a way and proportions as to kill the insect enemies and not kill the citrus trees. The benedictions pronounced upon his work were certainly not misplaced, and I would certainly not disparage the sturdy honesty and unflagging effort of so well-trained a mind and indefatigable a worker. The picture of Mr. Hubbard in the back yard of a country cracker, boiling soapsuds in a sooty wash kettle, is certainly not an ideal one as a scientific laboratory. The varying emo-

tions of success and failure as expressed by the looks on his face can certainly be better imagined by those who knew him, than they can be described. While Mr. Hubbard's efforts and his kerosene emulsion may be almost forgotton, the impetus given to this line of study is something that never can be effaced. He saw clearly the material at hand and the end that he sought. His work was to supply the missing link in the chain of thought. Scarcely had Mr. Hubbard's methods been published to the world when a score of workers plunged into the field and brought forth formulae after formulae, some of vastly different composition, but all designed for the one enemy—the insect of our fruit trees. Out of the vast array of insecticide formulae that has been published from time to time and used with more or less success, only a few remain as milestones to mark our way of progress. Kerosene emulsion stands as one of the insecticides today without any material modification from the state in which it was left by the master hand.

Another insecticide which came into the field about the same time and which has stood the test of time, is the sulphur spray. We have this represented in at least three different forms; the calcium sulphide, potassium sulphide and sodium sulphide. The calcium and sodium sulphides are sometimes somewhat modified by the introduction of a certain amount of salt. The essence of these forms is the sulphide. This form of insecticide can not be said to be an invention of our own generation, but dates back a century or more. Its application, however, is of a very recent time. While much of this material has been put on the market from time to time as an insecticide, the large amount that is now being used is manufactured from chemicals, the preparation which the older members of the State Horticultural Society will remember was reported to our meeting in Jacksonville by Mr. Swingle.

Another form of insecticide which has been of considerable importance is usually prepared from caustic soda, resin and whale oil. A more recent insecticide, and one which has been used to some extent, is the resin wash, made of sal soda and resin. These two forms of insecticides have proven themselves to be popular, but in recent years have had more or less of a decline from the fact that when used too frequently, they produce an ill effect on the trees. One of the more recent and popular forms that is now being used is potash whale oil soap. These three forms are especially useful for killing insects that have mouth parts, adapted for sucking the juice from the interior of the plant tissues, such as scale insects, plant bugs and white fly. Another popular and recent insecticide, which is only for certain purposes, is the flowers of sulphur. Sulphur is offered on the market in two forms; a lighter and a heavier. The lighter form is more useful, as it may be applied with less labor. The special purpose for which the flour of sulphur is used is the red spider groupe and rust mite. The popularity of sulphur arises from the fact that it may be applied in the dry form. Sulphur spray in its various forms is a more active agent, but is not so popular from the fact that a liquid insecticide is more difficult to apply than the dry form, and in the hands of careless employees the liquid may be used in too great concentration and injury to the trees and fruit result, while no reasonable amount of sulphur flowers or dry sulphur will prove injurious. Air-slaked lime and sometimes other substances are mixed with the sulphur to cause it to adhere better. The probability of a chemical action taking place between the flour of sulphur and the air-slaked lime,

after it has been applied to the tree, is doubtful.

Of the contact insecticides that have been recommended from time to time for use in the groves, we have practically remaining with us three of the most popular—kerosene emulsion, potash whale oil soap, and sulphur. For special purposes and for the use by certain persons, other forms may prove cheaper and more effective, but these three can be relied upon as effective and safe to put into the hands of the average farm labor as we find it today.

FUNGICIDES.

A few moments ago I told you how the work of insect warfare dated back to less than a generation ago. Today, it occupies a very important and conspicuous place on the programs of the meeting of every horticultural society. Twenty years ago all the ills a grove was heir to was ascribed to scale insect, but after the active orange grower had completely demolished all the insect enemies in his grove, he found that there were still enemies to conquer. He found that his trees were suffering from conditions that were certainly not brought about by insect depredation. He found those conditions in many cases beyond understanding, and his petitions were so strong and so urgent that they were heard beyond the borders of the state.

Less than two decades ago the work of destroying fungi by means of chemicals was inaugurated in this country. Today there are a number of factories which make machinery for applying fungicides. The successful tomato grower in Florida would as soon think of doing without fertilizers as doing without his Bordeaux mixture. During the short time that the work of combating fungi by means of chemicals has been in progress, a vast array of formulae have been suggested. For practical purpose the list has been reduced to two: Bordeaux mixture and dry Bordeaux. The labor encountered in applying Bordeaux mixture has been the main deterring factor in its use. Fortunately for the citrus growers of Florida, the necessity for using Bordeaux mixture is somewhat limited by the fact that the citrus trees are comparatively free from fungus enemies.

As early as 1894, the speaker was advised of the very great advantage it would be to be able to apply this substance in a dry or powdered form, and after spending considerable time in producing a dry Bordeaux in various ways and after getting a considerable quantity on hand, experiments with it were carefully conducted. As a result of the operation, the conclusion was reached that while it was practicable and possible to use dry Bordeaux, it was by no means as effective as the Bordeaux mixture. At the present time considerable interest is being taken in the question of dust sprays. While we hope to be able to ultimately reduce the onerous amount of work necessitated by the use of Bordeaux mixture, the end of our Bordeaux mixture period is by no means in sight. Prof. John Craig, of Cornell Experiment Station, gives us the following deductions of last year's use of the dust sprays: (Cornell Bulletin No. 216.)

"The labor and expense of applying dust sprays appear to be less than for sprays in liquid form. Six applications of dust spray were practically not more effective on apples than two applications of Bordeaux mixture; neither did they cost more.

"These experiments do not prove that insecticides and fungicides applied in dry form will prevent brown rot (Monilia) of the peach and plum. Further experiments are needed to settle the question.

"Dust or powder sprays should be applied in early morning or late afternoon. Damp, not wet, conditions of atmosphere and tree are desirable if not essential. The powder must be strictly dry. Thoroughness of application is as necessary as with Bordeaux mixture.

"Finally, it does not seem that at the present time there is any good reason why an orchardist who has reasonably level ground and available water supply and who is equipped with pumps for the application of liquid spray, should discard these, or even introduce the dry spray method. Under special conditions it certainly has its advantages; but the conditions demanding the employment of dry sprays are usually lacking in the fruit districts of New York."

FUNGUS ENEMIES OF INSECTS.

A very important step in advance in the warfare that we must not pass over is the use of fungus enemies for destroying especially the scale and similar insects. The usefulness of a fungus (Aschersomia) in combating the dreaded pest, the white fly (Aleyrodis citri) was clearly brought out at one of our Jacksonville meetings by Dr. Webber. For the use of various scale insects, the red-headed fungus (Sphaerostilbe coccophila) and the white-headed fungus (Ophionectra coccicola) are of inestimable and unappreciated importance throughout the entire citrus belt, from Louisiana to the capes of Florida. These two insect-destroying fungi play a most important and unnoticed roll. If you have any doubt of the efficiency of this fungus in controlling such pests as scale insect, spray your grove thoroughly with Bordeaux mixture for a period of two years. If you have any trees left by this time, you will find them in the last throes of insect destruction. Bordeaux mixture being a most excellent fungicide will have killed the fungus enemies of the scale insect and will have permitted them to breed in the most rapid progression possible. Throughout the entire citrus growing region it is entirely possible, though it might not be profitable in every case, to control the scale insect by means of these fungus enemies. This method of controlling the scale insect is growing constantly more and more popular, especially with the small citrus growers who find it possible to make a personal inspection of each individual tree.

BORDEAUX MIXTURE FOR DIEBACK.

Besides the use of Bordeaux mixture for destroying the fungus enemies of the citrus tree, it has been clearly proven now that the substance may be used to counteract the bad influence of certain soil conditions and misused fertilizers. In fact, a tree very badly affected by dieback may be entirely cured by the same means of spraying Bordeaux mixture on the leaves. The fact that Bordeaux mixture had a very beneficial effect on the Irish potato has been known for a considerable time. The usefulness of Bordeaux mixture, however, for curing and preventing dieback dates back to as recently as 1895.

VARIETIES.

Orange growing in Florida had its beginning with seedling trees. In fact all the older orchards were composed of seedling trees. This we might call the seedling period in the development of citrus groves in Florida. No sooner had citrus growing developed into the dimensions of furnishing pin money and pocket money, than the people were begining to cast about for better and more profitable trees. It was soon discovered that by means of grafting from trees that produced the finest fruit, that this quality was perpetuated. Immediately upon the discovery that citrus trees could be

top worked, came the period of citrus introduction. In examining the files of the Semi-Tropical Magazine; The Florida Dispatch; The Florida Fruit Grower and various other publications, we find that all quarters of the globe were laid under tribute to yield material for the building up of the citrus growing industry in Florida. It would hardly seem wise to burden my hearers with the names and excellent work and generous sacrifices made by the earliest orange growers of this state. In some instances their names are perpetuated by the names of new strains of oranges or by the naming of some post office or city after them. Of the myriads of varieties of both seedling and budded strains that have been introduced in the earlier and more recent times, only a few varieties remain. The Nobolis group has a larger percentage remaining of the original introduction than the sweeter or Aurantium group. This is undoubtedly due to the fact that the seedlings of the Nobolis group are less subject to variation. Consequently the offsprings from these seeds produce a type very similar or inferior to the introduced parent. The China (Mandarin) and Satsuma, occur apparently in the prime condition as they were introduced.

When we take up the sweet orange, we find that of the scores and scores of varieties that have been introduced and whose names appeared in catalogues and horticultural literature of a decade ago, a very few remain in their original purity. The original variety, when introduced to our Florida conditions, proved effective in one way or another, but springing out of these are numerous seedlings, some of them coming into existence and having an ephemeral existence and disappearing while others came to the front and have apparently come to stay. These varieties have been perpetuated because they happen to be better adapted to some particular location or section. We have oranges in a large section of the State known as Indian River Oranges, which did not have their origin in a single seed as in the case of other varieties, but are rather an expression of the adaptation to the particular environment. It is a well known fact in the Indian River section, that this variety or orange—if indeed it may be called a variety—comes very true to seed while, in the strict horticultural sense of the word, the Indian River orange is not a variety at all, but rather an expression of the composite group that is well adapted to the conditions as found on the East Coast of Florida. I believe it was at one of our Jacksonville meetings that our honored friend and citrus grower, Rev. Lyman Phelps, made the startling declaration (startling at that time) that the pineapple orange would be true to type only in the particular region in which it originated.

Another startling illustration of the expression of adaptation to particular environment was brought out by the Surprise Navel, which was recently disseminated by our able co-worker, Mr. E. S. Hubbard. The discovery of this variety is still fresh in the minds of the orange growers of Florida, the Surprise Navel, having but just come into good fruiting.

Taking our past experience with the sweet orange into consideration we may reasonably expect that the stock introduced from foreign countries, no matter how excellent it may be where it was originally grown, will prove itself lacking in some one particular or other, and that to get really first class fruit, we shall have to depend on either seed or bud varieties from those introduced.

When we shall adopt a new catalogue of Florida fruits, we will undoubtedly find that it will contain a still smaller percentage of introduced varieties than any catalogue

published heretofore. These facts point very clearly to you the direction in which we may seek improvement in our general stock of citrus fruit. Another consideration that has been brought out rather incidentally that the direction is that various areas of our great citrus belt will finally produce varieties that are best adapted to that especial locality. I have already alluded to the rather composite general name of the Indian River orange. When we shall have had another decade or two of selection and propagation, we will have a variety superior to our fine Indian Rivers of today.

When we come to the consideration of the pomelo group, we find that even a larger per cent. of the varieties have originated in Florida. This is a group of the citrus genus in which still more pleasant surprises are in store for us. We have at least a dozen well defined names to those that have originated in Florida and scores of others worthy of name remain in private groves. One has only to travel over a small area to find certain variations in the fruit which are of considerable commercial advantage and sufficient to warrant propagation. Captain Williams, at Rockledge, has a variety which Prof. VanDeman has recently named the Williams pomelo which, in addition to late ripening and being of superior quality, has a very striking habit of producing fruit largely on the inside of the tree, and singly rather than in clusters. I mention this merely to illustrate that there are numerous varieties of superior merit that are being propagated in a private way and have not found their way into the commercial world as named varieties.

### STOCK.

Coincident with the development of the budded citrus fruit period in Florida, came the demand for a stock upon which to bud. At first the stock used mainly was that of the sweet seedling. Later the wild hammock of the lake region having been budded and producing superior fruit, gave rise to the use of sour stock to bud on. During the early days of pomelo growing it was found profitable to use the seed of these as a stock. This is in fact still used to some extent, however, since the value and deliciousness of the pomelo have been recognized by the citrus eating public. This has become too valuable to be wasted for simply growing stock. There was a day in the history of citrus growing in Florida when pomelo groves were actually being budded over to oranges. At the present time the pomelo is undoubtedly the most valuable property of the citrus grower.

Various species of citrus genus have all had their turn at being the popular stock upon which to bud. As a result of all this labor, we have at last come to recognize the fact that there are certain regions and certain soils to which certain varieties are adapted and where it will do better than any other. In the northern part of the State, especially in the region where severe cold weather may be expected, the trifoliata has clearly the right of way. South of this belt it comes into sharp competition with the sour oranges and pomelo, each variety having a distinct advantage in different localities. Most recently the rough lemon has entered the field and has won laurels of distinct merit for growing trees rapidly and producing heavy crops of fruit on soils that are too light and sandy for other stock. For Central Florida, sour oranges, sweet seedless and pomelo are used to greatest extent.

### RESUME.

To recapitulate then, briefly, we may consider as fairly well established that the following points will hold in a general way

and that variations from this must be considered rather as special cases.

*Fertilizers*:—For the production of citrus fruits the ammonia should be entirely or to a large extent from a chemical source, sulphate of ammonia or nitrate of soda. The potash should be from a sulphate of potash source. The phosphoric acid from dissolved bone is held in the greatest esteem. Good fruit has been raised from dissolved rock as a source of phosphoric acid.

*Stock*:—For producing extreme hardiness the trifoliata is in greatest favor. For producing rapid growth and for growing on sandy soil, rough lemon is in the lead. A winter dormancy is not considered as an important factor, and on good hammock land, sweet or sour stock may be used to good advantage. Pomelo stock makes a somewhat more rapid growth and produces excellent fruit.

*Insecticides*:—No one substance seems to have a very strong lead over all the others. The form of material to be used will have to be determined somewhat by the locality, conditions and form of parasite to be combated. Kerosene emulsion, while still popular, is not so much so as it was in former years. Resin wash and resin compounds are useful where somewhat drastic measures are necessary. Sulphur spray in its various forms, and dry sulphur with its ordinary mixtures, are not sufficiently caustic for scale insects, but are employed successfully against red spider, spotted mite, purple mite, and rust mite. Dry sprays are coming into use, but have not yet extensively displaced the wet forms of insecticides.

*Fungicides*:—Bordeaux mixture has held its own against all competitors and stands out as the most effective and thorough fungicide we have. The labor encountered in applying it stands out decidedly against it. Dry Bordeaux has been used for years with varying success and disappointment.

*Variations*:—The conditions under which citrus fruits are grown in Florida are so radically different from other citrus-growing regions, that new varieties that are better adapted to particular regions and localities are constantly coming into prominence. No one variety of sweet orange can be said to be the orange par excellence for all regions. New varieties of pomelos are constantly coming into notice. We will soon have the seedless varieties in fact as well as in name. The seedlings of the kid-glove oranges are fairly true to type and the original introductions stand as the most excellent.

P. H. ROLFS.

## SYSTEMATIC FRUIT DESCRIPTIONS.

*Mr. President, Ladies and Gentlemen:*

It was long ago recognized in the study of plants and their parts that names were necessary, for how and by what other means could they be spoken of or referred to? To eliminate a name means a good deal of circumlocution, even when we have an exact knowledge of the object a writer or speaker would call to our minds. Soon it became necessary to describe or classify. Description preceded classification. The order was *recognition* of objects or their variations, *description*, and finally *classification*. Such has been the evolutionary process, but with everything new that science brings to light, with every new plant, with every new fruit, we pass through the same evolutionary steps.

The first descriptions were merely names, long drawn out. In other words, the de-

scription was included in the name. This was true, whether of plants or of fruits. Kaempfer's whole description of one of the kumquats, or, as they were called in his day, "kin kans," was *"Malus Limonia fructu pumilo aureo medulla dulci."* To be certain of the identity of a fruit from such a description is well nigh impossible, and had he not used the common name kin kan, and did we not know that he was writing of the plants of a region from which the kumquat is known to have come, the description would scarcely be worthy of note.

Many of the descriptions of later times have been little better. This has not been due to the inability of our modern pomologists to write good descriptions, but frequently they have not been able to get specimens at the needed moment, and all they have given us on many varieties is a little meager general description made up, possibly, from memory. Let me quote descriptions of three varieties of oranges to illustrate this point.

*"Star Calyx.*—A new variety, of peculiar looking foliage, rather crimped, limbs drooping in habit, early and prolific bearer; fruit small in size, of very sweet and rich flavor."

*"Mediterranean Sweet.*—Garey's.—Imported as a Shaddock by Ellwanger and Barry, Rochester, N. Y. It was sent to Thos. A. Garey, Los Angeles, Cal. After fruiting, proved to be the Mediterranean Sweet, with slightly different *qualities;* a late ripener, but fruit superior."

*"Ruby.*—Resembles the Malta Blood, and the pulp is marked a vinous red. The tree is a good grower and prolific bearer."

Many other descriptions of similar kind might be given. These are simply quoted to show how incomplete many of them are.

The old Florida Fruit Growers' Association published some good descriptions. Here is one for comparison. It will illustrate more forcibly than words can tell the shortcomings of those I have just given.

*"Arcadia.*—Size large; form somewhat flattened; color deep; eye set in slight depression; stalk inserted in a slight roughened cavity; skin smooth, with marked pits; thickness of skin, 3-16; longitudinal diameter, 2 3-4 inches; transverse diameter, 3 1-4 inches; color of flesh deep; grain coarse; pulp melting; juice slightly subacid; quality good. Supposed seedling raised at Arcadia and introduced by the Rev. William Watkin Hicks."

In general it may be said that the descriptions of a very large number of our Florida fruits are extremely meager. Where, for instance, are the descriptions of our pineapples by which one may recognize them or learn something of their peculiarities, characteristics and qualities?

Many varieties of citrus fruits, at one time grown in the State, are represented only by names. The varieties themselves have disappeared, and no descriptions are preserved. Perhaps it is well so, but one would like to know something more about them than is indicated by their mere names. Moreover, the origin of the majority of the varieties now cultivated is lost in obscurity, or is more or less a matter of conjecture. When and where did they come into notice, and who brought them forward? Who can say? Some good friend assists the systematic pomologist with the information, between '80 and '85, at such and such a place; while another, with equally good intentions, drawing from memory's store, says somewhere else, some time else. Far be it from me to belittle the value of such information, or to speak slightingly of the invaluable aid the fruit growers of this State have rendered me in my work; but the fact remains that many things one

would like to know cannot be learned, and little is to be found in black and white, print or writing, to definitely settle obscure points.

Frequently specimens of fruit are sent for identification. How difficult it is to give the desired information! Even with the most approved facilities, how difficult! True, nothing can supplant an intimate acquaintance with large numbers of varieties for this line of work; but good, clear-cut, accurate, well-classified descriptions are of the utmost importance.

Have we not need for systematic fruit descriptions? I venture to say that the Florida State Horticultural Society could do no more important a work than to embody, in its transactions, accurate descriptions of all the fruits grown in the State, illustrating them at the same time with good half-tone engravings.

We have in Florida the strongest body of amateur fruit growers to be found in the country. Their efforts are spent in attempts to improve the varieties at present cultivated. I might call to your mind many men whose names shall live in the annals of Florida Horticulture as long as time shall last. Moreover, I would call your attention to the attitude of our nurserymen in this matter. They are continually searching after new fruits, not for gain, I candidly believe, but to better the whole industry. The result of all this work, of all this activity, is that our horticulturists are live men; new varieties are constantly being brought forward, and for the stability of our pomology these varieties should be accurately described, and the descriptions should be published in our proceedings.

### WHAT CONSTITUTES A DESCRIPTION.

A good description of a fruit gives its outer and inner characteristics, its size, color, shape, markings, the color of its flesh, its juice qualities, the number of seeds, etc., lays special stress upon any distinguishing marks, and tries in some adequate measure to give an idea of its special and peculiar merits, its shortcomings and its weak points. No description of a variety is complete unless cognizance is taken of the tree, its appearance, its fruitfulness, its hardiness, its habit of growth, its vigor, its merits or demerits. Such notes as these are not easy to get, but in time they can be had.

To every description notes should be added, giving the time, place of introduction, and the originator or introducer of the variety. These can scarcely be considered an integral part of the description, but they are very valuable as general information, in a historical way, and oftentimes in tracing a variety and establishing its identity.

### EQUIPMENT FOR MAKING DESCRIPTIONS.

The equipment for making descriptions is neither elaborate nor expensive. For measuring the fruit, a pair of calipers, such as illustrated in the plate, shown elsewhere, are best. The particular pair from which this illustration was made will measure any fruit up to six inches in diameter. This instrument, one of the best, is made by Kraeuter & Co., Newark, N. J., and costs about 75 cents. The dial at the top registers the measurement. If any considerable amount of work is to be done, a pair should be secured, by all means. Calipers, like the other pair illustrated, may be used, but it is necessary to use a ruler in conjunction with them, and this is inconvenient. Fruits may be measured in cross-section with an ordinary ruler, but this is not always advisable, since in writing a description one proceeds from the outside characters to the inner ones, the measurements being among the first items considered. If we cut our specimen to get it, we have destroyed it for other features of the description.

CALIPERS USED IN MEASURING FRUITS.
Those at the left are best.

Filing Case for Keeping Records and Descriptions.

Color must be accurately described and, to assist in this, a good color-chart is desirable. Few people have a keen eye for color, and something of this sort is a great help.

For filing the description blanks nothing is better than a No. 58 Single Drawer Globe-Wernicke Filing Cabinet. These can be had with one, two, four or six drawers, as desired, and each drawer holds 650 to 1,100 (depending on the thickness) 5x8 cards. For most individual work, a single drawer, costing $3.75, is sufficient. If one does not care to make this expenditure, the descriptions may be grouped alphabetically and placed in large envelopes.

It is very desirable that, in addition to the description, a good photograph be made of the fruit and tree. Pages may be written about a fruit which will not give as good an idea of it as can be had in a single glance at a good illustration. See plate. While the average fruit grower cannot invest in a camera for this purpose alone, it may be he is so fortunately located as to have photographs made at small expense. The photographs should be filed with the description of the variety. If a painting of the fruit, in which the exact color is reproduced, can be made, so much the better.

### DESCRIPTION BLANKS.

It is best to have blanks of some sort, upon which descriptions may be recorded. A convenient size, and one, by the way, which fits the cabinet mentioned above, is 5x8 inches. On these the different headings may be placed, with blank lines for the description. Cards may be printed at small expense, or they may be written, either by hand or with the typewriter. To give a better idea of these blanks I have reproduced here a half dozen representative ones used in my own work at the University of Florida:

#### CITRUS FRUITS.

Variety.....Group..... ..... ....
Form.....Size.....Weight.....
Color.....Apex..... ..... ..... .
Base.....Calyx.....Stem.....
Rind..... Thickness.....Adherence....
Oil-cells..... Shape.....Size.....
Sections..... Number.....Size.....
Juice sacks.....Shape.....Size.....
Flesh.....Color.....Grain.....
Juice; color.....Quantity.....
Flavor; Acidity.... .....Sweetness..... .....
Bitterness.... . Bouquet..... ....
Quality.....Pith.....
Seeds; Form. ..... ....Size..... ..... ..
Color..... ..Number..... .....
Season..... Of whom obtained..... .....
Origin.....
General notes:.....
.....
Described by.....Date.....
University of Florida.
Department of Horticulture.

#### PERSIMMON.

Variety .....Group .....
Form .....Size .....
Color.....Markings .....
Cavity.....Apex.....
Stem.....Calyx.....
Character .....Thickness..... Skin.....
Flesh.....Texture.....
Color..... .....
Seeds ..... Form.....Size.....
Color.....Number.....
Season.....Of whom obtained.....
General notes:.....
.....
Described by.....Date.....
University of Florida.
Department of Horticulture.

#### PEACH.

Variety .....Group .....
Form .....Size .....
Color.....Apex.....
Cavity.....Stem.....
Suture..... Skin.....
Flesh..... .....
Flavor.....
Quality.....
Stone .....Form .....Size.....
Season.....Of whom received.....
General notes:.....
.....
Described by.....Date.....
University of Florida.
Department of Horticulture.

PLUM.

Variety .....Group .....
Form ..... Size .....
Color.....Bloom.....
Dots..... Apex.....
Cavity..... Stem.....
Suture..... Skin.....
Flesh.....
Quality..... .....
Flavor..... .....
Stone .....Form.....Size.....
Season.....Of whom received.....
General notes:..... .....
.....
Described by.....Date.....
University of Florida.
Department of Horticulture.

AVOCADO PEAR.

Variety .....Group .....
Form ..... Size .....
Color.....Apex.....
Base..... Stem.....
Rind..... Thickness.....
Flesh.....
Color..... Texture..... Thickness.....
Flavor.....
Quality.....
Seed.....
Form .....Size ..... Color.....
Season..... Of whom received.....
General notes:.....
Described by.....Date.....
University of Florida.
Department of Horticulture.

GUAVA.

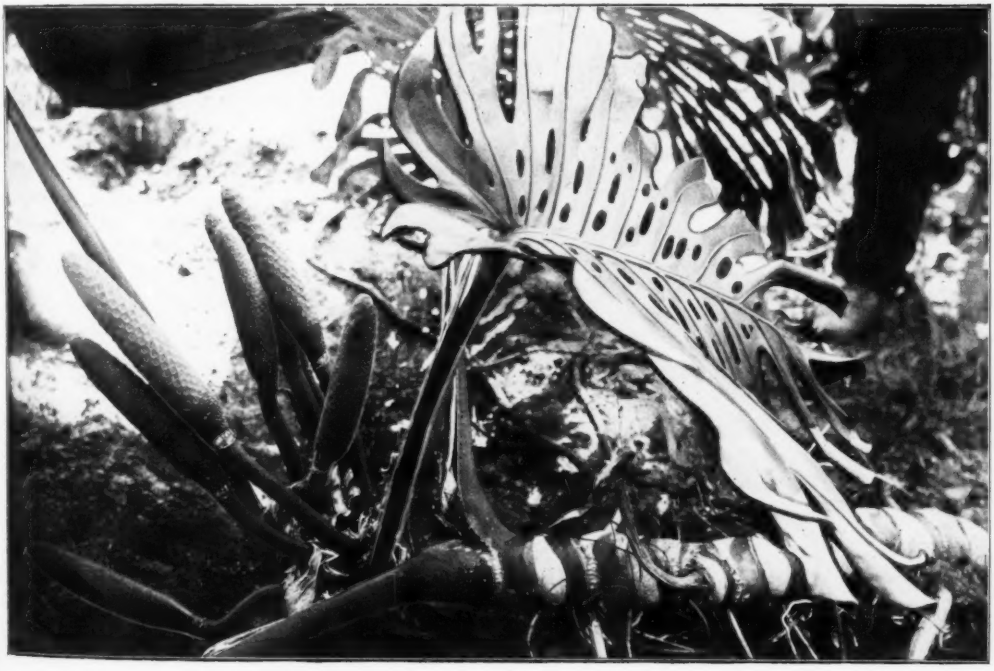
Variety .....Group .....
Form.....Size.....
Color.....
Base.....Stem.....
Apex.....Calyx.....
Skin.....
Thickness..... Astringency.....
Flesh..... Thickness.....Texture.....
Color.....
Flavor..... Quality.....
Seed.....Size..... Color.....
Form.....Number.....
.....
Of whom received..... Season.....
General notes:.....
.....
Date..... Described by.....
University of Florida.
Department of Horticulture.

MAKING THE DESCRIPTION.

It is needless to say that a typical fruit should be chosen from which to make the description. If a half dozen specimens are at hand, showing the normal variation, a conglomerate description should not be made. Describe from a typical specimen, and to the regular description add notes on the variations.

Suppose we take, for example, the description of an orange. The name of the variety and the group to which it belongs having been written down, the form next claims our attention. It may be *round* or *flattened* (oblate). The size may be *small, medium* or *large*. We can decide exactly which it is. We can measure it and tell how many it will take to fill a box, and classify the variety accordingly. Put down the actual measurements. I have always followed the rule of giving the measurement from base to apex first, followed by the transverse diameter. Measure two or three specimens, so as to establish variations, if there be any. The weight will be an index of quality. The old rule given by our Society for judging citrus fruits is a good one to determine this point. Drop the fruit in water. If it is heavy and juicy, it will sink just below the surface of the water. In oranges there is a great similarity in color, yet they are not all alike. A golden yellow hue may be *light*, it may be *dark*, or in the blood oranges, it may be *very dark*. But look out! Color varies with the maturity of the fruit. Some, such as Prata, are always light colored. Note the apex. In Navel oranges it is more or less characteristic; in others it is not so much so. But it may be *depressed, scarred, rounded*, or *flattened*. The base about the stem is sometimes *smooth*, sometimes *creased*, and in some varieties of Mandarin oranges it is *nippled*. Occasionally, as in Starcalyx, the calyx is characteristic, the

THE MAYS POMELO.



MONSTERA—*Monstera deliciosa*. Stem, Leaves and Fruit.

## PHOTOGRAPHIC RECORDS.

stem may be *stout* or *slender*. The thickness of the rind is important; measure it; it may adhere *loosely* or *tightly*, say which. The oil cells may be *elevated* or *depressed*. In Tangerona the oil cells give the rind a pebbled appearance and feeling. The shape is sometimes quite noteworthy. In the Beauty Mandarin, for instance, they are distinctly *oval*, long and flattened like a double convex lens. Usually they are *balloon shaped*. Their size should be noted, *large* or *small*. The juice sacks are always spindle-shaped, but they may be *broad* and *blunt* or *narrow* and *elongated*, and they vary considerably in size in the different varieties. The color of the flesh should be noted. The grain is governed by the size of the juice sacks and has little or no relation to the quality of the fruit. But it is worth mentioning. Lemons, for instance, are fine grained; Mandarin oranges are coarse grained. The color of the juice varies little. It is usually *yellow* or *almost colorless*, except in quantity. In the blood varieties it is *pinkish*. Quantity is important. Oranges of the same size vary considerably in this respect. Cultivation and fertilization have a great influence on the amount. Flavor is hard to describe. Much depends upon taste. Any tendency toward excessive *acidity* or *sweetness* should be mentioned. Most oranges are *sub-acid*. Quality, too, is a matter of judgment. It may be *poor, medium, good, very good*, or *best*. The pith, its texture, whether *open, porous* or solid, should be described, and its diameter should be given. Seeds are variable in *form, size, color* and *number*. Unfortunately, they are influenced by pollen, but frequently they are characteristic. Season is important. The name of the person from whom the fruit was secured should always be given. It is desirable information, and furthermore, the grower should always be given credit. Where did the fruit originate? Find out, if you can, and put it down. Under general notes, express yourself on the merits of the fruit and the characteristics of the tree. Add your name and the date. Who described the fruit? The name is a guarantee of the exactness, the merit and the responsibility of the description.

CLASSIFICATION.

Classification is necessary. Without it we are lost in a muddle of varieties. Where there are but few fruits of a kind, classification is not essential. When the number increases, some system must be introduced. When we systematize our knowledge, it is easier to remember, easier to get at. The group to which a fruit belongs is often an indication as to where it can be successfully grown. Would a man plant a large acreage of peaches, of the Chinese Cling group, in Florida?

Peaches may be divided into *Honey, Peen-to, Persian, Chinese Cling* and other groups.

Plums are referred to as *Japan, Japan Hybrids, Domesticas*, etc.

Sweet oranges may be classified as *Blood, Navel, Spanish*, or *Mediterranean*.

Persimmons may be *light, dark* or *mixed* in flesh.

Mangoes may be divided according to the variety from which they originated. *No. 11* is a well marked group.

Avocadoes may be classified according to shape—*bottle shaped, oval, round*.

Pineapples may be divided into *Queen, Cayenne* and *Spanish* groups.

Frequently the species from which the varieties are derived may be used as a basis.

H. HAROLD HUME.

President—The next in order, if we take up the regular order in the way it comes, is the Report of the Standing Committee on

vegetables. This Committee consists of Messrs. E. S. Hubbard, Geo. W. Leonard, and Johnson Helm. Is this committee ready to report?

## REPORT ON VEGETABLES.

*Mr. President, Ladies and Gentlemen:*

Owing to the goodness of his heart, or some other unexplained motive, our worthy President has seen fit to put me on the Committee on Vegetables. Now, fellow members, I am not, strictly speaking, a vegetable grower, or even a vegetarian, and on the whole I don't know that it makes any difference if I am neither, or that what I may leave unsaid will be any great loss to the aggregate of knowledge, for of all the people who tempt dames Nature and Fortune in wooing increment to their wealth from mother earth, I believe the growers of winter vegetables in Florida can furnish the most startling and contradictory tales of affluence and impoverishment.

These crops are, so to speak, exotic, in that they are taken from their natural habitat in temperate climates to brave the vicissitudes of our sub-tropical winter and to undergo climatic extremes to which they are not naturally accustomed.

To begin with, Jack Frost has a way of bounding with a hop, skip and jump over our peninsula, and he doesn't fall, like the rain, on the just as well as the unjust, but shows vagaries and partialities in the same locality that are enough to cause hard feelings among neighbors. The rainfall itself is an uncertain quantity, usually, on our sandy soils, in deficiency; yet the vegetable grower on low lands may wade out some moist day to find ponds in his garden and the tops of his vegetables waving their arms frantically for help above the surface of the water. Irish potato growers have been known to paw earnestly around in the mud searching for sound pieces of seed.

The lettuce grower is uncertain how many crates he will fill before wilt, like a thief in the night, devastates his crop and language is hardly strong enough to express the feelings of the celery grower who steps out some fine morning to find his maturing crop going to seed. Some truckers again put the profit of one season's crops into the ground the next season, and it vanishes from their sight. In fact, it is a question if the average of one-crop truckers support their families and make competencies.

Undoubtedly the true basis for truck gardening is along the lines of diversified farming, and the examples of the most successful Irish potato growers at Federal Point and Hastings is illustrative of the question.

It hardly pays a farmer in Florida to grow corn successively on the same land, if fertilizer sufficient to make a good crop, team hire and all the labor is counted. Yet there is fertility enough for corn left after Irish potatoes, and with up-to-date tools, corn is planted immediately after digging potatoes, to be laid by in cow peas and pastured off with crab grass by fattening stock or milk cows at the end of the season. As a rotation, it gathers nitrogen, adds humus to the soil, feeds the horses and chickens without cash outlay, and pays. The same is true of hay and Irish potatoes. The land is properly leveled and two cuttings of crab grass will average three tons of hay to the acre, at $15 per ton worth $45—a saving of more than enough to put in the next crop of Irish potatoes, the sod keeping up humus in the soil.

Sweet potatoes are also grown with profit after Irish potatoes, though considered more of a drain on the soil than the previously mentioned crops, while sugar cane

and rice also receive attention in the same manner.

Now, there are probably locations where diversified rotative culture is hard to apply, but the long-sighted trucker, who is making a home, must undoubtedly consider the question in every part of the State.

For instance, on the lower East Coast, tomatoes will only thrive profitably two years before a six or eight year rest is demanded for blight, rotations must be studied out that will keep the land fertile and productive. In time it may be necessary to grow the Irish potato only alternate years, though this season the blights have done little damage, and the questions of profit in dipping seed for early blight and spraying for late blight have been inconclusive. Last season the Maine Experiment Station figured that the increase in sound potatoes only paid expense of spraying, which is not very encouraging for the small grower to invest in spraying apparatus and material and take time in the busy season to apply remedies.

In fact, so far as Florida is concerned, moist soils, well drained, ample fertilizers, thorough culture and last, but not least, sound or vigorous seeds of disease-resisting varieties, are the most important matters to consider in vegetable culture. The following notes by Mr. Geo. W. Leonard, of Hastings, and this committee, are of interest regarding his locality:

Cabbages are all right for a money crop if the mercury does not go below 22 degrees. Any temperature below that cooks them.

Celery has not been much of a success this winter; so much wet and cold weather, it couldn't grow.

Cauliflower has done very well in the open this winter in small patches. It is more tender when weather is cold than cabbage, but those who have tried it speak well of it, and think they will do more with it next year.

Cukes are being tried this spring. Vines look well and are setting a good crop. It is too early to say what the yield will be.

In conclusion I will say the Irish potato crop at Federal Point and Hastings was a deficient stand in many cases, owing to wet weather after planting; but the yield and prices, on the whole, are satisfactory.

E. S. HUBBARD.

## THE GARDEN.

*Mr. President, Ladies and Gentlemen:*

Our subject dates back to the advent of man, the Garden of Eden, the most beautiful situation in the whole earth, the paragon of places, from whence our first parents were driven, their lives not being commensurate with so high a privilege. We find that the products of the garden were highly esteemed in very early history. We have Scriptural authority for the fact that Esau traded his birthright for vegetable pottage; also that some of the children of Israel would have turned back from their pilgrimage of great promise in the wilderness that they might again enjoy the cucumbers, melons, leeks and onions of Egyptian bondage. As we come along down through the annals of history we learn of the suspended or hanging gardens of Babylon, the enchanting beauty of which words were too meagre and language too inadequate to express. Thus the authenticity and status of our subject shows forth with the great and important things of creation.

The narrow phases of the modern garden are legion. We picture the garden as being a small enclosed tract of land in close proximity to the dwelling, but here in Florida it has become an expansive field, striving with the farm for supremacy. This brief article will be confined to some of the

things which I am doing or which should be done in Duval county.

In selecting ground, great results are in store for careful and correct judgment. The greater part of the trucker's ground should be low, but susceptible to perfect drainage. Quite a number of vegetables attain their perfection on high ground; therefore both high and low are needed for the production of general varieties.

No one should undertake the cultivation of low ground in Florida until the drainage has been carefully planned and considered in connection with the work. As the sand has the faculty of getting through almost any aperture, with the water, effectual blind drainage has not been realized. I have for several years known of, and am about to have manufactured, a tile which will blind-drain Florida sand perfectly. It is horseshoe shaped and joins under a collar. Through the flat or under side are made two holes, about two-thirds the diameter of the bore of the tile. The water seeks its level up through these holes and flows off rapidly, while the sand is kept down by the force of gravity. The joints of these tiles are to be cemented over the top and down the sides to the bottom, that no water may enter from above the lowest part of the tile. Four boards tightly nailed together, with two-inch augur holes bored through the bottom at short intervals, will do the draining; but where these lengths join each other they must be perfectly and tightly covered over the top and down the sides, that no sand can go through with the water. If possible, the surface or furrow drains should go east and west with the rows, but if such is not possible in a feasible way, a surface drainage must be provided for the immediate relief in heavy downpours of rain. All high grounds sloping abruptly should be worked under the plan of the terrace, for the conservation of the rainfall.

In the latter part of summer or early fall a general preparation of the ground should be commenced by heavily and evenly manuring the whole surface of the ground to be plowed. In this land of perpetual harvest the fertilizing should be very bountiful, for, if your management is good, you will take up the plant food before it can get away from you. Most likely the last crop taken from the ground will have been crab grass hay, for through all the summer and through early fall it interposes itself at every opportunity. Therefore a coulter attachment to your plow will be necessary, which must be kept sharp with the use of a file at short intervals. The plowing should be careful, uniform and thorough, bringing up a thin shaving of subsoil each year. Ground especially which has been under cultivation a few years should be treated this way. The subsoil seems to possess maiden properties which are very effective in germinating seeds and sustaining plant life. Under this process you are also deepening the soil, which should be continued indefinitely, if possible. Any visible grass should be driven down between the furrows with a spade.

A harrow with the teeth slanting backward should be used, which tends to press the grass and roots downward, and rather slides over than pulls up anything that the plow has covered. Ground treated in the above manner, harrowed at once, again one week later, and the third time two weeks from the first, will have practical immunity from cut worms and, if the tillage thereafter is frequent and thorough, the question of their annoyance will be settled.

After the last harrowing, a board as long as the harrow is wide, placed under the center of the harrow, width-wise, sloping back, with the teeth, and its width extending an inch or more below the ends of the

teeth, fastened in any simple way, will make a very effective smoother, quickly preparing the ground for the seed drill.

We are now where the line of procedure should be carefully thought out. A woven wire fence resists natural vegetable growth less than any other, therefore causes less waste of ground. The raising of unseasonable vegetables should not be attempted without an organized preparation. The varieties in general demand should be given consideration.

The seed question is now in order and is, I am sorry to say, the most disturbing element in the trucker's peaceful occupation. Adulterated, old, degenerate and defunct seeds interpose themselves in profusion and are responsible for a vast amount of trouble and often eventual overthrow and failure. Some measures have been taken to prevent this slaughter of the innocents, and I imagined for a short time that matters were to be better, but was disappointed, for the swindle was soon in full thrift and has since so continued. I suggest that truckers raise their own seeds to the extent that it is possible for them to do so, which will in a degree deliver them from this terrible imposition. The seeds one may be obliged to purchase should be bought from some reliable dealer with the understanding that they are to be taken back and money refunded if they do not prove good under reasonable test. Always try your seeds before using. I am practicing the above. In raising seeds one should avoid hybridizing and mixing by keeping seed plants well apart; also use the best specimens to avert degeneracy.

It is no longer a theory that all planting should be done east and west. The returns of several years' practice in comparison with planting otherwise have justified the conclusion. In cold weather the sun shines on the ground between the rows from morning till night, while in the summer time the plants shade and protect each other from the excessive heat. Best of all, rows running east and west afford the finest facilities for intersetting and interplanting, which is yet to become a great factor in Florida gardening, wonderfully increasing production. I do not mean to discourage interplanting when the rows are not to be had that way, for the privilege is very profitable under any circumstances, and especially in close proximity to a city where land is at a premium.

The vegetable kingdom, in the aggregate, is much like the animal kingdom in that it will wander less, or confine its roots to a smaller area, if all its requirements are at hand. Hence the intensive system of production. Deep and lavish enrichment of the soil, with frequent and careful tillage, will afford great impetus to growth, also much earlier maturity.

Plants well grown from choice varieties should commence the garden, and never be absent thereafter. They should be ready for the ground when the third harrowing and smoothing have been finished, and should be set immediately, while the land is in the pink of condition. Have your plans all made how to meet the known emergencies which may beset you. Some are likely to come whose advent you have not taken into account. Also seed should be sown immediately upon the perfect preparation of the soil. They should be thickly sown, as a precautionary measure, also to provide plants for other grounds coming under preparation at a later period. As the chameleon harmonizes its color with a new resting place, so the verdure of winter is transformed into the garlands of spring. In this brief article time would fail me to relate the minutiae and variableness necessary to carry this work through its full course.

Fertilizers are used as desired in every period of growth—quick soluble chemicals

and slow rotted stable manures forked or spaded in between the rows preparatory to setting plants or sowing seeds in either hills or drills.

Some system of protection against the cold waves which are liable to visit us should be formulated and settled upon, with every facility for hasty action. The plant beds are easily disposed of by digging one or more holes in the bed or beds, as required, placing down into them the common household kerosene lamps, to be kept burning all night, under a well joined covering. Plants in the field may be covered with earth drawn upon them with a hoe, pulling the plants over and closing the hearts, if possible. Potatoes, cabbages and some other plants may be covered with a plow, but the furrow must be very light. For cucumbers, squashes and melons greater care is required; therefore the hoe is best. I have practiced this method of covering for several years and find it the best I have ever tried. I have lost plants under boxes, paper and cloth, but none under earth. A very slight earth covering suffices for the plants' safety, and they will receive no injury therefrom as long as the weather continues quite cold. The labor is not lost on the ground, as when the plant is erected through the loose earth, its condition applies on tillage. It is in a degree a species of cultivation.

One should strive hard for the earliest market, which is the cream of the occupation. When a product has been generally offered for a few days it is no longer a thing of much profit.

The insect pest of muskmelons and squashes is largely averted by getting them started early and promoting a rapid growth. Corn also has practical immunity under like circumstances. Now that a rapid growth is shown to be most important, frequent and thorough tillage must be had, shallow at all times, and not waiting for the growth of weeds. The rapid growth can be accomplished in no other way.

The capillary condition of the surface of the soil should be broken by cultivation quite frequently, not only for the preservation of moisture, but also as a remedy for the evil effects of flood and inundation, as soon as practical after their occurrence. Cultivation is a great agency for the normal condition of soil and plant life. It makes plants more vigorous, enabling them to appropriate more from both soil and atmosphere. The drought porosity of the soil, according to my investigation, comes from the gases of decomposition, which is in process all of the time, but much more active in warm weather. Structural changes resulting from heavy rainfalls, vegetable matter deposited in solution, the shifting up and down of the water line and the condition incident to its own process are conducive to gas generation. So one standing over a body of water in warm weather will see occasional bubbles coming to the surface, though the lake may have existed for untold centuries. Now, the broken surface of cultivation arrests the vapor on its way up out of the earth, as do the cooling effects of heavy mulch condense, as well as preserve, the heavy moisture.

The complete equipment and philosophy of gardening avails nothing if the fertilizing is not well planned and thoroughly executed. I would advise everyone engaged in the business to qualify themselves upon the formula for fertilizing such things as they have decided to produce, and make no misconnections, for they are fatal. Defunct and antiquated seeds dismiss you after a little, but the spurious fertilizers will drag you along through the entire season, and at last unrelentingly sacrifice you.

I will not at this time say anything about the double planting that I am practicing,

further than to cite thought in that direction. The work is profitable and interesting and affords its own inspiration, but it must be thoroughly pondered over and unswervingly executed. I am sure it is destined to be a great feature in the future garden of Florida. It is a golden privilege, with that bountiful provision, that emerald gem, crab grass, which has yet failed to awaken the general appreciation of our brother Floridians. I am agriculturally familiar with many of our States, and, in not one, is there a spontaneous, bountiful, three-fold harvest without a seed time, which is the status of crab grass. It is now (the latter part of March) striving for ascendency over the other plants and, if favored with a little timely attention to start in with,—only a minimum of labor,—would give three heavy cuttings of hay worthy of the most fastidious attention. The use of this hay for more than fifteen years has established and fully substantiated the estimate I have given it. When we recount this field so rich and full of prospective enterprises, can we do other than exclaim, "Truly our lines are drawn in pleasant places?"

Intensive gardening is a science of no mean proportions; it is the work of a prince or a peasant. He who clasps hands with the mysterious, unseen, all powerful, is one of nature's noblemen. "The man with the hoe" may be brother to the ox from an industrial point of view, but he is obedient to Divine injunction, and gets his bread by the sweat of his brow. I believe that gardening is today little more than in its infancy. Its followers are like young eagles; rising from the mother's nest, they declare their eagleship. But what do they know of eagling? Have they vied with the very clouds in their flight? Have they pierced the heavens with the velocity of lightning and pounced upon their prey?

A few months since I read an article which stated that if the world's inhabitants continued to increase as they had been and are still increasing, that very shortly after the year 2000 A. D. the earth would be unable to feed its population. It seems to me any attempt to estimate such a striding possibility is superfluous. The real Armageddon of agriculture and horticulture will be fought only when emergency precipitates the battle. Methods will be revolutionized, plants will be known as animals —their requirements, affiliations and aggressions understood. The severest economy will dominate the surface of the whole earth; the mountains will be terraced, the valleys will be plateaued; small streams will be placed in conduits; tidewater will be fenced away from the marshes with self-acting gates to release the ebb and close against the rise. The shallows of the sea will be reclaimed. The arid places of the earth will store their water supply and add to by artificial means for the period of their necessity. The floating gardens of the Orient will come into universal use. The demand has already gone forth to the rock, "Why cumber ye the soil?" What with artificial light, artificial heat, and a manufactured soil and perpetual growth, not only the subterranean places of the earth will be utilized,

But garden upon garden, in layers piled high,
Will extend far up into the dome of the sky.

While this may seem to be an extravagant view, the principle is not only in the realm of possibility, but is being incipiently practiced today.

ABRAM WHEELER.

President—We will now take up the report of the Standing Committe on Fertili-

zer and Irrigation; this committee consists of Messrs. C. M. Conner, R. E. Rose, and Guilford Wakelin.

(The folowing article was made quite interesting by Prof. Conner with the use of steriopticon lantern, showing the different methods of irrigation in Florida.)

**REPORT ON IRRIGATION.**

*Mr. President, Ladies and Gentlemen:*

It is hardly necessary to say anything along the lines of irrigation, the reasons for irrigation or anything of that kind, so we are going to show you a number of pictures, illustrating the different processes of irrigation, giving you an idea of the way water is put on the land in the different parts of the country. You know, that the great trouble is to get water elevated. In the West where they can get the water from the mountains, it is easy, but in this part of the country where the water is mostly obtained from springs and sulphur wells it is another proposition. We have here some pictures showing the various methods.

Irrigation in Florida is confined to the trucking and citrus districts principally, and is found necessary owing to the fact that the bulk of our rain during the summer, falls too late for the early vegetables, and sometimes the lack of rain in April and May, injures the citrus crop by stopping growth.

Water is lifted for irrigation by artesian wells, steam engines, wind mills. Water from streams and lakes, which are higher than the fields to be irrigated is also used.

Artesian wells are used more than any other method. The cost is not great and, after the plant is once installed, it costs little to operate. One well will irrigate from five to ten acres, depending upon the flow and the character of the soil.

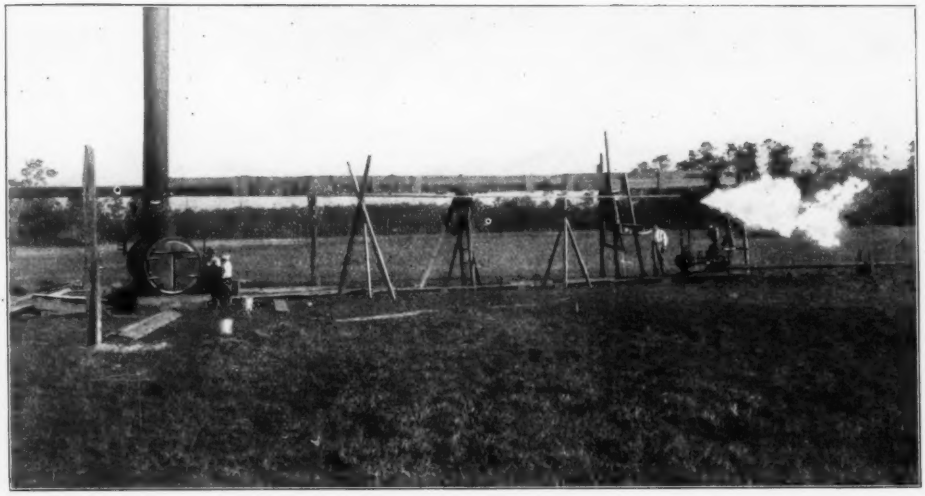
Pumps run by gasoline engines are extensively used in some sections where the lift is only a few feet. A number of these pumps and engines are found in the neighborhood of Webster. Five horse-power engines are used in most cases. One man at Bushnell had a seven horse-power steam engine, pumping from a lake. The water was carried to the field in a wooden flume which was raised high enough at the lake to let the water run to the field by gravity.

Where a storage tank can be had at a small cost, wind mills are used with some success. Tanks of much capacity must be constructed of earth, in order that the expense does not run too high, and since the soil is mostly sand and does not hold water, it is rather difficult to erect an irrigation plant where wind is to be used for lifting the water. When this method is used, wind mills of the ordinary type are used. On the sea coast, where the direction of the wind is constant, that is, from one direction, a type known as the "Jumbo" may be used. One of this type is in operation near Cocoanut Grove.

The taking of water from lakes and streams by gravity must, of necessity, be confined to those localities where the country is undulating and the field situated below the level of the water. While it is true that this method of irrigating is quite limited, there are numerous instances where water could be used and crops made, whereas the water is allowed to run away and the crops to suffer. A number of streams of this character are found on the State Experiment Station grounds. They have been led out of their course around the hillsides, and used to water crops during the dry season.

In distributing the water, sub-irrigation is used more than any other method. When the ground is too wet during the rainy season, and tile drains are used for taking off the water, they may also be used for irri-

DISTRIBUTING WATER
OVER FIELD
FLORIDA
EXPERIMENT
STATION
PLOWING AROUND HILL TO DISTRIBUTE
DAM IN SMALL STREAM



PUMPING WATER FROM THE LAKE.

CARRYING WATER TO THE FIELD.—Bushnell.

gating. Some have used a three-cornered box, made of 1x5 inch plank, with fair success. These troughs, or boxes, have small holes chopped in the edges, which let the water out. When artesian wells are used to supply the water, a small amount of water is kept running as the drouth advances, thus keeping the water table near the surface and depending upon capillary action to lift the water up to the plants; this method is followed to some extent in the potato district. Some of the vegetable growers have iron piping laid and attach a hose and sprinkle their crops. A large sprinkler, much like a huge lawn sprinkler, which is supposed to cover a circle of about fifty feet in diameter, was seen at Bushnell. Some orange growers have similar devices.

Surface irrigation is not much practiced, except where water is plentiful. In this sandy soil, water escapes so rapidly that a much larger amount of water is needed to irrigate a given area by surface irrigation than by sub-irrigation. At the Experiment Station surface irrigation was practiced exclusively and, although the soil is very sandy, it was found to work very satisfactorily. A small stream, furnishing about as much water as would flow out of a three-inch tile, furnished enough water to irrigate two acres of land as fast as two men could prepare and plant.

Irrigation in Florida is as yet in its infancy, and will be used more and more as the country settles up. As to the best method to use, it will depend upon local conditions.

C. M. CONNER.

## FERTILIZERS.

*Mr. President, Ladies and Gentlemen:*

Probably there is no subject that is of greater interest to the horticulturist than the question of fertilizers; certainly there is none upon which there is a greater diversity of opinion.

Seldom do we find two growers who fully agree on this most important subject. Men, eminently successful growers of fruits and vegetables, differ widely as to the best combinations of the recognized elements necessary for the best results. But one general proposition is agreed upon; namely, that nitrogen, phosphoric acid and potash are essential to the growth of plants and fruits. The best source of these elements, however, is a much disputed point. Some advocate the use of pure chemicals, others insist upon the organic compounds. Cotton seed meal, fish scrap, blood, and tankage for ammonia are advocated by some, with apparently sound reasons and favorable results, while again with equal positiveness, and with equally as good reasons, deducted from experience, they are condemned by others.

No greater diversity of opinion can be found than on the subject of potash. The sulphates, muriates and carbonates, all have their advocates. Each champion of a particular salt, cites conclusive results from actual experience, as reason for his opinion; again we find those who condemn all the salts of potash, and pin their faith to organic sources.

The question of phosphate is probably one on which the most divers opinions exist: whether rock, bone, or slag phosphates, are preferable, which yield the best results, are questions that vex the grower. Each has its champions, and in each case apparently conclusive evidence of the superiority of the particular form is given. That these differences are honest and the divers opinions justified cannot be questioned. It is most likely accounted for by the various kinds and classes of soils, particularly in Florida; and most largely caused by the varying physical conditions

of our soils, ranging from the almost pure sand of our high pine scrubs, to stiff clays; from shell hammocks, to muck ponds; from a limestone reef, to a peat bed; from the flat woods and low hammocks, where the permanent water table is less than three feet below the surface — and for months less than six inches — to our high pine, sandy ridges, where permanent water is found not closer to the surface than from thirty to fifty feet. Certainly under these divers conditions of altitude, physical structure, and moisture, to say nothing of chemical composition of the soil, different results may be expected from the use of fertilizers.

Recently considerable agitation and discussion has been had, and a great deal of criticism caused—favorable and otherwise —particularly in the trade journals devoted to commercial fertilizers, by the publication of Bulletin No. 22 of the Bureau of Soils, in which much stress has been laid on the physical condition of the soil, its capillarity, and capacity to retain soil-water, etc. Numerous analyses of soils, and of soil-waters, have been made and classified in this Bulletin, and certain deductions drawn at variance with the usually accepted conclusions as to the value of the three accepted plant foods.

Chemical soil analysis—as such—has to a large extent been discredited, and the larger, or smaller, proportionate amount of soluble plant food in the soil, or soil-water, shown to be of little value in deciding the question of fertility or productiveness. Soils of apparently the same physical structure, and of similar chemical composition, are shown to be widely different in productiveness. In numerous cases soils producing crops above the average, were found to contain less soluble nitrogen, phosphate, and potash than other soils of apparently similar structure and composition, and under similar conditions of culture that produced very inferior crops of the same kind.

Recently a new factor has been recognized in agriculture, one which up to a few years ago was unknown, and is still but little understood. I allude to the "bacterial" influences—the numerous ferments, yeasts, or bacteria. That these minute organisms play an important part in successful agriculture, is now acknowledged; that their presence is necessary in all fertile soils cannot be denied; that their absence will, at least in the case of certain plants, particularly the legumes, prevent the growth of the crop is acknowledged.

Until recently it was known that clover and other legumes would fail to produce crops on certain lands, though provided with all the necessary plant food; that certain soils were "clover sick." It was also known that frequently this condition could be changed by the application of a small quantity of soil from a productive field of clover. This method of inoculation has been practiced for years; the *fact* was known, the *reason* was not.

In our own State we find it frequently the case that cow peas, velvet beans, etc., fail to grow satisfactorily. The same fields after a few years, particularly if live stock is allowed on the fields in the fall or winter, produce abundant crops of these legumes.

The culture of alfalfa has frequently been attempted in Florida, with little success. A few small areas have promised to grow, but in a short time disappeared, though well fertilized and properly cared for. Recently, however, the necessary bacteria has been introduced and the soil inoculated. The results to date are very encouraging, and it is to be hoped this valuable forage plant may be successfully established in the State.

In parts of the State, as is known to many of those present, it is practically useless to attempt to grow certain crops by the use of commercial fertilizers only. No matter what kind is used, nor the quantity applied, failure will result if the plants are not "started off" with a small application of stable manure; too small a quantity to afford any appreciable amount of plant food, still enough to introduce the necessary yeast, or ferment, into the soil, to prepare the commercial fertilizers for the plant. I might cite numerous instances of similar conditions. Doubtless all of you have met them, when, for some unknown, obscure reason, land failed under proper conditions of culture, season and fertility, to produce profitable crops, and where, without apparent change of conditions, the same became productive. May we not account for numbers of soil problems, particularly in Florida, by this means? The question is one of intense interest, and of great importance, but little is known of the subject. The field is broad, and years will be required to come to any definite conclusions.

Soil physics, and biology, are important questions; in fact, of equal if not greater importance than soil chemistry. Soil temperature, moisture, physical structure, drainage, aeration, and above all bacteriological conditions are necessary studies before we can intelligently prescribe a formula for a proper fertilizer for a given soil.

Agriculture is the most ancient art, and the youngest science. Many a farmer knows "how" to produce good crops; few of us know "why" we do certain things to produce certain results—which frequently fail, though conditions are apparently identical.

Probably no State in the Union uses more fertilizers in proportion to the area cultivated than does Florida; certainly the returns from its intelligent application are nowhere greater. The quality or grade of commercial fertilizers demanded by Florida growers is high, much higher than that of other States. This demand for high grade fertilizers and manurial chemicals has led to the establishment of factories and depots in our seaports, where a supply can be had at all times of goods of any description at prices that are in many cases less than at interior locations or eastern ports.

The demand has also brought into the State the peddler of fertilizers, as the demand for nursery stock has brought in the "tree peddler." Our horticulturists have been educated to severely let alone the "tree peddler," and deal only with reputable nurserymen, who have a business and reputation to maintain. I wish to urge upon all purchasers of fertilizers to avoid the "fertilizer peddler" also. His goods are, if possible, of less value than the "tree peddler's." His methods are the same, and his arguments and statements of just as much value. We have many reputable and responsible manufacturers and dealers, who will sell you your goods at fair prices, with full guarantee as to quality. They are well known and fully responsible for any contract they may make. The peddler is not. In not a single instance have I known the goods sold by a peddler to be as represented, and in numerous instances they were utterly valueless.

Cargoes of imported potash salts are now frequently imported direct into our Gulf and Atlantic ports, and sold for less than they can be purchased at eastern cities, and re-shipped into Florida. This State is now one of the largest producers of fertilizers in the world. Her phosphates, of which nearly 1,000,000 tons were exported in 1903, are of the highest grade known, and

are used in every civilized country. Few realize that we are annually sending millions of dollars worth of fertilizers—phosphates and cotton seed meal—not only to foreign lands, but to the West, those lands, said to be of matchless fertility, are now drawing on Florida for the necessary plant food to grow their wheat, oats and beef, to fatten the steers of Colorado, New Mexico and Texas.

Florida has until recently been looked upon as a sterile, sandy waste, or coral reef, barren and unproductive. By many she is still imagined to have no agricultural resources, on account of her unproductive soil. The facts are no State in the Union has more fertile soil and greater wealth of fertilizers than has Florida.

No State nor country can, with the application of the same energy, intelligence and fertilizers, produce more net returns from a given area than can be produced in this State, the resources of which the world in general knows so little of.

R. E. Rose.

Dr. Kerr—I have a few questions to ask. There is a great deal of muck land in our neighborhood and a gentleman wishes to know when the muck is properly drained do you plow this land and turn it over?

Prof. Rose—It depends on the condition whether you have to plow or not. I put under the plow, one year, twelve acres of muck land, but the ground was very soddy and I had to have five cattle to pull the plow and then six more to get the other five out.

Dr. Kerr—Another thing I want to know for this gentleman is, whether or not it is a good land for tomatoes?

Prof. Rose—If the land is well drained it will produce a good crop of tomatoes, but it is a soil that in its natural condition is not good for cultivated plant life.

Porf. Kerr—I have one other question: What will destroy tomato or cabbage worms?

Mr. Painter—Arsenate of lead or Paris green will destroy the cabbage and tomato worm. The arsenate of lead is the best as it does not burn the foliage.

Member—It seems to me that the Paris green is poison and a great many people are afraid to put it on their vegetables.

Member—Paris green is put on the outside leaves of the cabbage and not on the heart, and before it comes to the table of course these outside leaves are washed, and no harm can come of it.

The meeting adjourned till Thursday morning at 8:30.

# THIRD DAY.

## MORNING SESSION.

Thursday, April 28, 8:30 a. m.

President—The first in order is the report of the Standing Committee of Forestry. This committee consists of Capt C. E. Garner, Dr. Wm. C. Richardson and Mr. Irving H. Welch.

### REPORT OF COMMITTEE ON FORESTRY.

*Mr. President, Ladies and Gentlemen:*

The general forestry bill before the State Legislature in 1903, to which Hon. Geo. W. Wilson alluded in his report for that year, failed to become a law, for reasons unknown to this committee.

The educational work through the newspapers and other agencies has been active during the past year, and it is believed that at the next session of the legislature at least an effective *forest fire law* and perhaps a comprehensive State forestry law may be enacted.

The importance of forest protection to the horticultural interests of the State must be apparent to all. The influence upon climatic conditions and consequent effect upon general horticulture are too well known to require repetition here. In Italy, the subject has been considered so vital that the government has undertaken the work of reforestization simply for the benefit of the horticulturists.

Nearly all of the United States already have comprehensive forestry systems, and the wisdom of Florida's most thoughtful citizens says we must take intelligent and prompt action for the preservation of our most important, though rapidly disappearing resource, in which the members of this Society are very deeply interested. The statement has been made by the best of authorities that Florida has but five to six million acres of virgin timber left, and the naval stores operators alone require a million acres annually of fresh timber, so that the end of the day of the native forest is so close at hand that the shadow of the obsequies already appalls us. The Bureau of Forestry of the Department of Agriculture, through the promotion of the Herty cup system, and in other ways, has already performed invaluable service, for the owners of pine particularly, and for the State in general, and stands ready to render further aid, as appears by the correspondence between Forester Gifford Pinchot and the Forestry Committee of the Board of Trade, with which your committee is co-operating.

It is the present intention of this committee to accept the offer of the Department to send next fall a man skilled in forestry matters, to confer with those familiar with Florida needs, with a view of drafting a bill embodying as comprehensive a State forestry policy as the information and experience at hand enable us to do, which bill it is hoped the combined influence of this Society, the Jacksonville Board of Trade, and others interested, will be able to induce the members of the next session of the Legislature to place upon our statute books. In the meantime, both committees solicit the members of this Society to freely offer information and suggestions for

their guidance, and also to most earnestly impress upon the members of the House and Senate, from their respective districts, the importance of the passage of this measure.

The correspondence between Forester Gifford Pinchot, of the Bureau of Forestry, and Chairman Irving H. Welch, of the Board of Trade Forestry Committee, and also a member of this Committee, is given in full for information.

Respectfully submitted and your thoughtful consideration asked by

C. E. GARNER,
WM. C. RICHARDSON,
IRVING H. WELCH,
Committee on Forestry.

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## HON. OVERTON W. PRICE WRITES THE RECORD ABOUT FORESTRY LAWS.

On the 19th of January last Hon. Overton W. Price, of the Bureau of Forestry, on invitation of the Southwestern Lumbermen, delivered before their annual meeting in New Orleans an address on the importance of a more efficient forestry policy by the people of this country.

On the 20th ult. the editor of the Record wrote him a letter, asking for suggestions along the line of its fight for a forestry code, and the following is his reply:

United States Department of Agriculture,
Bureau of Forestry, Washington.
March 17, 1904.

Your letter to me of the 20th ultimo, dealing with the question of necessary forest legislation in Florida, brings up a matter in which this Bureau is keenly interested. You ask what State, in my judgment, has the best system of forest laws, including a forest commission. I consider that Pennsylvania ranks first in this respect, while the forest fire laws of Minnesota are notably good.

You ask what, in my judgment, is the legislation required in Florida. That is a question which can be answered in the best way only after a thorough study on the ground. The history of State forest legislation in this country is marked by many examples of action of intention, but futile because at variance with local conditions and needs. Just as the forests of the private owner require detailed study on the ground as the basis of an effective plan for their management, so is the best solution of the forest problems of a State possible only as the result of a careful study of the problems themselves.

There are few Eastern States whose permanent prosperity depends more largely upon wise use of forest resources than that of Florida. The importance of the naval stores industry and the proportionately large area of land within the State which is suitable only for forest growth, render the State forest problem a vital and urgent one. In my judgment, the necessary knowledge for its best solution has not yet been obtained. For example, Florida requires an effective forest fire law, but none the less a careful study on the ground to determine the best methods of protecting the forest from fire under the law.

Co-operative studies between a State and this Bureau in order to solve forest problems similar to those which Florida presents, is one of the most important lines of work carried on by this Bureau. For example, we completed last season a field study of Northern New Hampshire in co-operation with the State. We are conducting now, in co-operation with the State of California, a comprehensive forest study which will be the basis for the institution of a sound forest policy on the part of the State. This study includes the preparation of a forest map showing State forest resources,

a study of forest fires in order to determine necessary legislation and effective methods of fire prevention and control, a study of the best methods and the probable results of tree planting in localities where it is required, and of the most practicable ways in which private owners may hasten the production of a second crop upon lands which they lumber.

If such a study in co-operation between the State of Florida and this Bureau could precede the enactment of forest legislation, it would, in my judgment, be the best solution of a problem in which we are keenly interested here.

Very truly yours,
OVERTON W. PRICE,
Acting Forester.

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Jacksonville, Fla., April 5, 1904.

Mr. Gifford Pinchot,
Chief Forester, Dept. of Agriculture,
Washington, D. C.

Dear Sir:—This Board of Trade, which is strictly an industrial organization, having the promotion of the highest interests of our city and State as its sole object, has taken a deep interest in the subject of forestry.

At the annual meeting last January, through the advice of our President, Capt. C. E. Garner, a Forestry Committee, consisting of Messrs. Reed McLane, Montgomery Corse, E. E. West, F. S. Hodges, W. F. Coachman, D. N. Reynolds, Harold Weston, Arthur Meigs, D. Warrington, J. D. McEachern, Henry Clark, J. P. Lynch, H. A. Hodges, and Irving H. Welch was appointed, President Garner being ex-officio member. This committee, of which the writer has the honor of being chairman, was instructed to take such steps as seemed expedient for the enactment of a forestry law at the next session of the Legislature, for the preservation of our remaining forests, and the reforestization of our cut-over timber lands. The interest of the committee is that of broad-minded gentlemen, most of whom are well known, and combine personal and philanthropic interests in the question and are anxious to obtain the very best results.

We will be very glad to avail ourselves of the offer made by Mr. Overton W. Price, of your Bureau, to send a man from the Department to co-operate with one from this State in the study of the local conditions to determine what legislation would best serve our needs, as suggested in his letter of March 17th, copy enclosed, clipped from the Industrial Record, of Jacksonville. We had a little talk on this subject with the Honorable Secretary of Agriculture, James H. Wilson, on his recent visit, and were assured of his assistance whenever we are ready.

We will be greatly obliged if you will kindly inform us when it will be convenient for you to send us a man to begin work as suggested by Mr. Price, and will appreciate such suggestions as you wish to offer.

It is our purpose to get somebody here to go with the man from your Bureau, who will be profited by the investigations, and can continue the work under the laws which we hope will become a part of our statutes. With this in view, we are corresponding with Dr. T. H. Taliaferro, of our State Agricultural College, at Lake City, and hope to secure a man already possessing some knowledge of the subject, as well as familiarity with local soils, climatic and forest conditions. We have no State or other available appropriation to defray this expense, and must depend on voluntary subscriptions. The character of the men making up our committee, however, gives perfect confidence in this direction, and we await your attention with assurance that your noble efforts in your Department are fully appreciated, and we trust much good

may result to the State of Florida from this movement.

Yours truly,
(Signed) IRVING H. WELCH,
Chairman Forestry Committee.

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April 5, 1904.

Dr. T. H. Taliaferro,
Lake City, Fla.

My Dear Professor:—The enclosed letter is self-explanatory. Capt. Garner suggested that we write to you to hunt us up a man for this place. We trust your acquaintance will enable you to name somebody possessing the high order of ability and character commensurate with the importance of the service to be rendered. If you haven't read the article referred to, please ask Mr. Holloman for a copy of the Record containing it.

Thanking you for your help, I am,
Yours truly,
(Signed.) IRVING H. WELCH,
Chairman Forestry Committee.

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Washington, D. C., April 8, 1904.

Mr. Irving H. Welch,
Chairman Forestry Committee,
Jacksonville, Fla.

Dear Sir:—Your letter of the 5th has given me a great deal of pleasure. I am particularly glad both that so strong a movement has been organized in your State for the best use of the forests, and that opportunity presents itself for this Bureau to share in the work.

In my judgment, the most effective plan would be for the Bureau to send a man early next fall to discuss matters fully with you and with others who know forest conditions in Florida and their needs, and to supplement the information thus obtained so far as practicable by study in the field. In this way, and with the knowledge that this Bureau already possesses of forest problems in Florida, we shall be ready for the next step. This should be the drawing up of a bill carrying an appropriation for a study of State forest problems in co-operation between the State and the Bureau of Forestry, provided an equal amount is expended by the Bureau in the work. It is probable that an appropriation of $5,000 by the State, and the expenditure of the same sum by the Bureau, would be sufficient to collect the necessary data to serve as a basis for an effective State forest policy. If the Bureau can thus co-operate with Florida, as it has already co-operated with New York, New Hampshire and California, I believe that it will lead to the most effective solution of the urgent State forest problems before you. I want to assure you of the keen interest of this Bureau in the proposed work. It is an important evidence of the remarkable recent development in the South of a strong movement toward conservative forest management.

Very truly yours,
(Signed.) GIFFORD PINCHOT,
Forester.

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April 16, 1904.

Mr. Gifford Pinchot,
Forester, U. S. Dept. of Agriculture,
Washington, D. C.

Dear Sir:—Your favor of the 8th, suggesting that your Bureau send a man next fall to discuss forestry matters with us, with a view to obtaining a $5,000 appropriation to be used with a like sum from your office in the investigation of the forestry needs of Florida, and appropriate legislation therefor, received. We desire to express our deep gratitude for your prompt interest in our behalf.

We fear your plan contemplates too long a time, and too much expense, before re-

sults will be realized. The regular session of the Florida Legislature convenes next May, meeting biennially. If we obtain the appropriation you suggest at the coming session, two years would then be occupied in investigation before there would be an opportunity to enact the necessary laws for reforestization and protection, and before the law could become operative, at least three years would elapse. In the meantime, the devastation goes merrily on, and no protection is afforded. With the information at your command, and such investigation as might be made next winter, don't you think we could prepare a comprehensive bill to be introduced at the 1905 session?

No doubt your plan would be the wiser one, but for the urgent necessity for immediate relief. The subject is one that the average timber owner even has given but little thought, and many objections to anything stringent will be encountered, especially if any considerable appropriation will be required to make the law effective. Perhaps the plan you suggest might be the wiser, as it would allow more time for the education of the taxpayers as to the necessity and wisdom of forestry laws. We feel that your experience and observation is invaluable, and that we should be guided largely by your judgment, however, and will be pleased to hear further from you.

Again thanking you in behalf of our committee, I am,

Yours truly,

(Signed.) IRVING H. WELCH.

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Washington, D. C., April 20, 1904.

Mr. Irving H. Welch,
Chairman Forestry Committee,
Jacksonville, Fla.

Dear Sir:—Your letter of the 16th is at hand. I agree with you heartily that the institution of an effective State forest policy for Florida should be delayed no longer than is absolutely necessary. But I feel too, that a certain amount of preliminary work is essential to the best results. The information that this Bureau already possesses, supplemented by the knowledge gained through discussion between you and others who know forest conditions in Florida, and their needs, and an agent of this Bureau, will be a sufficient basis for an effective forest fire law and possibly for legislation along other lines. But before a bill can be drawn up embodying a comprehensive State forest policy, it is in my judgment essential that the study outlined in my letter of the 8th be made.

To sum up, this Bureau will be glad to send a man early next fall to take matters up with you and with others, and to use the results he obtains and the information already at hand as the basis for a bill to be introduced at the next session of your Legislature meeting the urgent needs of the forest situation so far as the knowledge at hand enables us to go. This Bureau looks forward, if the necessary appropriation is made, to co-operation with the State in the thorough study of forest conditions necessary to the institution of a comprehensive and well considered forest policy for the State.

Very truly yours,

(Signed.) GIFFORD PINCHOT,
Forester.

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April 23, 1904.

Mr. Gifford Pinchot,
Forester, U. S. Dept. of Agriculture,
Washington, D. C.

Dear Sir:—We have your esteemed favor of the 20th, saying you will send a man from your Bureau early next fall to advise with us relative to forestry needs and the enactment of a forestry law at the next ses-

sion of the Florida Legislature, and again thank you for the interest manifested and suggestions offered.

The Florida State Horticultural Society is co-operating with our committee, and we hold ourselves in readiness to take up the work at the time most convenient to you. We sincerely trust that from your wise experience, we may be able to draft some measure that our combined influence will be able to enact into a law that can be enforced, affording the protection so badly needed. Kindly advise as long in advance as possible of your plans, and much oblige,

Yours truly,

IRVING H. WELCH,
Chairman Forestry Committee.

Dr. Richardson—I had intended to write a paper on the subject of Forestry, but my wife says that I am a genius and I think she is right. I am a genius in the line of procrastination and I have simply put off writing this paper.

In regard to Forestry, I will say, that this is a subject that seems to be very much misunderstood, and misunderstood not only by the average person, but by professionals in this line. We see all kinds of articles published in our daily papers and prescriptions given by various people throughout the State in regard to the forestry question and its preservation. It is said that the destruction of the forests is one of the principal causes of the cold spells that have been felt within the last few years. I think there is nothing in this theory. Visit the Northwest and see those great forests, go to Dakota and see the condition of those forests, and in all those Western states, in spite of the destruction of a great portion of the forests, there is no change of climate there. As long as lumber is used as it is, there is little hope of the preservation of forests. The question is the resurrection of the forest. Look back to the days when it was customary to build roads from one city to another, from one state to another, out of wood; today, look at the different methods of building roads of other material than wood, showing that wood is not used today as extensively as it was in those days. The cutting of timber is very profitable, and as long as it continues to be so there is little hope for the ceasing of the cutting down of forests. We should turn our attention to the resurrection of the forests.

Mr. Blackman—I have a few words to say that will come in on a line with forestry. The planting of trees is a subject that is of great interest to all the members of the Horticultural Society. For years at the annual meetings of our Society, we have had this subject of tree planting for wind-breaking purposes well taken care of, it having been discussed quite a little. For a year or more I have been looking for a tree to plant on the margin of a lake for a distance of a quarter of a mile where we want a wind-break. I am quite in favor of the Catalpa tree as a wind-break. In about four years these trees attain a growth of about 12 to 15 feet and make a break so dense that it is almost impossible for a bird to fly through. I have been saving all the seeds of this tree that I can get and intend to plant them.

Mr. Pierson—In connection with this forestry subject, I have a few questions I would like to ask on this Catalpa speciosa. How close should it be planted? what kind of land should it be planted on? how long does it take before the tree is matured?

Capt. Garner—I know really very little about it. It is one of the best shade trees that has ever been discovered. I have taken a great deal of interest in that tree and have had a number of discussions on the subject. I am very anxious that the railroads should plant the Catalpa along their

*Paste this on Page 89.*

## ERRATA.

The paper presented by Prof. P. H. Rolfs on "Citrus Diseases" has been omitted, and most of the discussion has been left out. The following is a brief outline of the paper as presented.

### DIE-BACK.

1. Character of the disease.
2. Cause.

I. Die-back soils.
- (a) Underlaid with hard pan.
- (b) Shell lands.
- (c) Coralline lime stone.

II. Organic fertilizers.

III. Treatment.
- (1) Use of inorganic ammonia.
- (2) Use large quantities of sulphate of potash.
- (3) Spraying with Bordeaux mixture.

WITHER TIP. (This disease is frequently diagonosed as die-back).

1. History of spread of disease in Florida.
2. General description.

(I). On leaf of
- (a) Orange.
- (b) Pomelo.
- (c) Lime.

(II). On twig of
- (a) Orange.
- (b) Pomelo.
- (c) Lime.

(III.) On fruit of
- (a) Lemon.
- (b) Lime.
- (c) Pomelo.

IV. On bloom of
- (a) Lime.
- (b) Pomelo.

V. Illustration of
- (a) Photograph of pomelo tree in the last stage being killed with fungus of wither tip.
- (b) Illustration of fruit of pomelo attacked by the same fungus.

### BLIGHT.

1. Variations observed during different seasons, and during different years.
2. Non-bearing trees not affected.
3. Trees usually put on a heavy crop before taking blight, or the converse is true, that blight frequently follows a heavy crop.
4. The disease is probably not transmissible by buds.
5. It is possible that the disease is disseminated by implements.
6. The disease affecting the root system and manifested by
   - (a) Matted root condition.
   - (b) Destruction of smaller feeding roots.

## DUST SPRAY.

The use of dust spray has been recognized for a considerable time. Experiments were inaugurated by the author as early as 1894.

Dry Bordeaux mixture was made at that time in considerable quantity, and experiments in applying the substance. The results of the experiments were so very much inferior to those attained by the use of wet Bordeaux mixture applied as a check, that further experimentation was discontinued. Prof. John Craig of the Cornell Agricultural Experiment Station gives the following resume of experiments

## "DEDUCTIONS FROM THESE EXPERIMENTS ON DUST SPRAYS."

"The labor and expense of applying dust sprays appear to be less than for sprays in liquid form. Six applications of dust spray were practically not more effective on apples than two applications of Bordeaux mixture; neither did they cost more.

These experiments do not prove that insecticides and fungicides applied in dry form will prevent brown rot (*Monilia*) of the peach and plum. Further experiments are needed to settle the question.

Dust or powder spray should be applied in the early morning or late afternoon. Damp, not wet conditions of atmosphere and tree are disirable, if not essential. The powder must be strictly dry. Thoroughness of application is as necessary as with Bordeaux mixture.

Finally, it does not seem, at the present time, that there is any good reason why an orchardist who has reasonably level ground and available water supply, and who is equipped with pumps for the application of liquid spray, should discard these, or even introduce the dry spray method. Under special conditions, it certainly has advantages; but the conditions demanding the employment of dry sprays are usually lacking in the fruit districts of New York."

## FUNGUS ENEMIES OF CITRUS INSECTS.

1. The white fly parasites (*Aschersonia turbinata* and *Aschersonia aleyrodes.*
2. The red headed fungus, (*Sphaerostilbe coccophila.*)
3. The white headed fungus, (*Ophionectra coccicola.*)

lines in this State; it makes the best cross-ties. No wood has been discovered that will stand the ravages of time and climate conditions as well as the Catalpa.

We have a Catalpa that is indigenous to this soil. A gentleman from DeLand was telling me yesterday that they have planted 60 acres and have good success with it. If our railroads in this State would realize the importance of the Catalpa tree, it would be adopted. The Illinois Central Railroad has planted 200 miles along the line of its roads.

Speaking of the destruction of our forests, if we stop to think that in the United States there are 200,000 miles of railroad, taking 24,000 cross-ties to every mile of road-bed; the average length of time these ties can be used is from six to seven years; with these figures we can realize how much wood it will require in this country.

One of the members of this Committee spoke of the profit of cutting down the forests, and although there may be profit in this work, I cannot agree with the Doctor. I really am very much impressed with the idea that this one question is of more real importance to the State of Florida than any other question that could come before the Legislature. I think that every effort should be made to preserve the forests and prevent the constant destruction of the forests in the State of Florida. If no tree would be cut down until it was grown, no forest cut over until it had reached maturity, the destruction of the young forests would be prevented. Mr. Pinchot, who is the head of the Forestry Department of the United States, is a man who is much impressed with the idea of the preservation of the forests of our country. He is a man who has given his time to this great work and will not receive a cent of pay for his services. During the last year or two he has sent several experts into our State with a view of getting an accurate idea of the extent of the forests in Florida, and I am glad to say that these experts reported that the forests in this State were really better than in any other State in the country.

I wish to say in regard to the Catalpa, that the properties of that tree should be known by the people of Florida and more interest be taken in the planting and cultivation of this tree.

In regard to an exhibit to be made in St. Louis this summer by some Society interested in tree growth, it seems that this Society is to make an exhibition. Among other exhibits they are to show telegraph poles and railroad ties of the Catalpa which have been in use 32 years. The Catalpa tree seems adapted to the soil of Florida.

Dr. Richardson—I am in full sympathy with the report of the Committee and with forestry, but I still say that the cutting of wood is profitable. The yellow pine, I think, is a very fine kind of wood and it has its use, but I believe the Catalpa is so far superior to the pine that they cannot be spoken of in the same connection. The cultivation of these trees may, and probably will, be profitable.

## ANTHRACNOSE ON THE POMELO.

*Mr. President, Ladies and Gentlemen:*

Attention was called to this disease in Bulletin 53, Florida Experiment Station, under the name, Leaf Spot, as at that time it was observed only upon the leaves.

### DISTRIBUTION OF THE DISEASE.

During the past fruit season, 1903-1904, this new disease has appeared on pomelo fruit in a number of different sections of the State, and a careful examination of the fruit, both in the field and in the laboratory, has proved that this new disease is caused by the same fungus, *Colleotrichum gleosporioides* Penzig, as causes the leaf

spot. Early in the season it was observed in two or three different and widely separated groves in the eastern part of the State, and, a little later, diseased fruit was forwarded from West Florida. Later on, investigation of the fruit in a number of groves in the western part of the State showed that the disease was widely distributed in that section. Specimens of fruit were also received from a number of different points in the interior of the State. An examination of the pomelos held for sale by the fruiters of Jacksonville, Florida, showed that the disease must have been quite prevalent throughout the State. It was almost impossible to find any considerable amount of fruit exposed on the fruit stands in which a few diseased specimens, at least, could not be found.

From these observations, we may safely conclude that the disease on the fruit is likely to occur in any portion of the State and that it is at the present time widely distributed, though, as pointed out later on, there appear to be certain conditions especially favorable to its development.

This disease on the fruit was first observed by the writer in the autumn of 1901, but attracted little attention at that time, as the damage was slight, only a few specimens of diseased fruit having been observed in a single grove. Since that time the disease in the grove where it was first observed has increased to such an extent that the trees, on which it was first noticed, yielded a very small proportion of sound fruit during the present season. The disease has probably been at work for a considerable length of time, and, as is usual in such cases, attracted little attention until it became serious. The loss during the past season in two or three instances has amounted to from five hundred to a thousand dollars in a single grove.

From our present knowledge of this disease, it appears to be on the increase, and we are probably justified in predicting that it has not yet reached its worst. The disease is, in all likelihood, an introduced one, and it may be looked to attack the sweet orange in addition to the lemon, lime and pomelo. It frequently occurs upon leaves, twigs and branches of the sweet orange, and, on one occasion, sweet oange fruit on one of the fruit stands in Lake City, Florida, were observed, covered by lesions (diseased spots) caused by this same fungus, *Colletotrichum gleosporioides*.

### THE DISEASE ON THE FRUIT.

The fruit may be attacked either on the tree or after it is removed. Specimens of rind, removed from fruit which had been shipped to Chicago, have been examined, on which the disease was present. It was said to have been perfectly sound at the time of shipment.

The most conspicuous damage, during the time the disease has been under observation, has been to the fruit while it still remained upon the tree. Upon the fruit, the presence of the disease is first manifested by an irregular, brownish discoloration. The discolored area is irregularly defined around the margin. The diseased spot may be on any portion of the fruit, and may vary from an inch or so in diameter to an area nearly equal to that of the outside of the fruit. As it progresses, these spots gradually change in color, sometimes becoming greyish, sometimes somewhat lighter. Ultimately, however, the whole affected area becomes dirty black in color. If the point of infection is small at first, it gradually enlarges, under favorable conditions, so as to embrace the whole fruit. Sometimes the affected area remains constant in size for a considerable time, in which case, in its older stage, it varies from black at the center through various shades of brown, brownish yellow

to the normal yellowish color of the healthy rind at the margin.

The black discoloration is caused by the formation of the spore bearing parts. These dark fruiting bodies are so numerous as to make the fruit black. Under a hand lens, they seem to be rather irregular in size and shape, and are elevated above the surface of the diseased rind. The outer ends of the oil cells are depressed, the depressions showing a wrinkled appearance. From these fruiting bodies sporules or spores are produced. They are very minute, measuring only from 16-18 by 4-6 microns.* Under the microscope they are seen to be cylindrical, rounded at the ends and hyaline in color. They have but one cell. Frequently, minute, round, light colored areas may be made out in them.

The disease starts at the outside of the fruit and works inward as well as around it. The mycelium of the fungus seems to progress more rapidly toward the center of the fruit along the partitions or dividing septa than it does through the pulp; but it grows in both. The mycelium is branched and grows at will; first through the inner portion of the rind, later entering the fruit.

The disease is confined to the rind for a considerable period, and the flavor of that portion of the pulp immediately beneath the seat of infection is normal for sometime, while the opposite side of the fruit retains its normal quality for a much longer period. Ultimately, however, the flavor of the whole fruit is distinctly altered. The bitterness in the flavor is probably unchanged, but the acid and sugar in the juice are either broken down or destroyed. In consequence the bitter taste is very strong and being unmodified by either sweetness or acid, is quite disagreeable. Besides this, the juice and pulp are permeated by the flavor of decay and emit the distinct odor of citric acid.

While fruits attacked by the disease usually present the appearance already described, at other times the trouble manifests itself by the appearance of a large number of circular or more or less irregular brown areas. The rind immediately beneath and surrounding these areas is depressed, but in the center the discolored spots are frequently somewhat elevated. They become more prominent as the rind dries, contracts, and becomes thinner. When placed in a moist chamber the disease soon embraces the whole fruit and the rind becomes very dark in color, owing to the large number of fruiting bodies of the fungus formed.

### SUGGESTED CAUSES OF THE DISEASE.

It has been stated by growers that the disease was caused by spraying, by the effects of cold, or by the strong sunlight. While it must be recognized that any condition which reduces the vigor of the tree, or any part of it, acts as a predisposing cause, still the immediate cause of the disease is the fungus already referred to, and were this not present the disease would not occur. It has been found on sprayed and unsprayed trees, on fruit in the sun and in the shade. The fruit may be affected on any part, base or apex, on the side facing outward when hanging on the tree, or on the inner side. It has been found in sections where no fruit was touched by frost, though it frequently develops on frosted fruit. It has been found on fruit well up in the tops of the trees and on fruit borne on the lower branches and touching the ground. From these facts we must grant that neither spraying, frost, sun, shade, nor the position of the fruit on the tree has anything to do with the *cause* of the disease. It is probaly true that the fruit near the ground, where the air is

*A micron equals 1-2500 of an inch.

moist and where the fruit is more shaded, may be more subject to the disease. Aside from this, the position of the fruit has no bearing on the virulence of the disease or in rendering the fruit more susceptible to attack.

CONDITIONS FAVORING THE DISEASE.

*Starved condition of the tree.*—In animal, so in vegetable life; the vigorous, well-fed individual withstands disease, while the weak, starved one succumbs. The pomelos are naturally vigorous growers, and we are probably not far astray when we say that, compared with sweet orange trees, of equal size and age, they require from one-fourth to one-third more fertilizer. In a number of instances poorly fed trees have been attacked on leaf, branch and fruit by the disease, while better nourished ones immediately adjoining showed no signs of its attack. The remedy in this case is obvious.

*Wind.*—Where trees have been badly whipped by the wind, causing abrasions on the fruit and branches and tearing the leaves, the disease adds to the injury already done. The wounded spots are very readily attacked. On the other hand, trees standing in still areas, where there is little or no air movement, are more subject to attack than are those about which the air circulates freely. The trees should not be subjected to the whipping force of the wind, neither should they be so hedged in or walled about by standing timber as to prevent a free circulation of air. In the matter of forest protection, the middle course should be pursued.

*Frost.*—The disease usually follows injury to the leaves, branches and fruit by frost. The spores of the fungus gain access to the tissues through the parts injured.

*Disease.*—Trees suffering from die-back, foot-rot, or any other disease are more subject to the attacks of Anthracnose than are those which are entirely healthy.

*Insects.*—These devitalize the trees and puncture the tissues, thus making it possible for the fungus to gain a foothold. Among those insects which appear to assist in increasing the attacks of the fungus may be mentioned, in particular, the different scales and mites.

*Bruises.*—The slightest abrasion of the surface of the fruit opens up a way for the entrance of the fungus. The greatest care should be exercised in handling the fruit to prevent injury to the rind.

REMEDIES.

*Removal of diseased fruit.*—All diseased fruit should be taken from the trees, and if any should have fallen to the ground, it, too, should be collected. Destroy all badly affected fruit; either bury it deeply or burn it. Fruit showing only slight effects of the disease may be sold in nearby markets.

*Pruning.*—Cut out and burn all dead and diseased branches. Rake up and burn all leaves lying about and under affected trees.

*Spraying.*—Trees on which diseased leaves and branches appear should be thoroughly sprayed with Bordeaux mixture early in the season (May, June, July). If spraying is needful and desirable as the fruit nears maturity, spray with ammoniacal solution of copper carbonate. Three or four applications at intervals of ten days may be necessary. Mr. E. P. Porcher, Cocoa, Fla., successfully combated this disease and stayed its progress by this means.

Fruit on which the disease is likely to be present should be sprayed after removal, so as to prevent its development on the way to market.

*Washing.*—Many growers wash their fruit before shipping it. Ammoniacal

solution of copper carbonate may be added to the water used in washing. Another good substance for this purpose would be potassium sulphide.

H. HAROLD HUME.

### DIE-BACK.

*Mr. President, Ladies and Gentlemen:*

As opinions are of value to the extent of experience only, I will have to confine myself to die-back.

*Cause:* Lowlands, containing either an excess of humic acid or iron, do cause some die-back; but, in the vicinity of St. Petersburg, this disease is nearly always caused by an excess of nitrogen, and especially from organic sources. Or we may otherwise state the case as a deficiency of potash and phosphoric acid, for with proper proportions of these mineral elements, a tree will, of course, use to an advantage a greater amount of nitrogen than when the mineral elements are deficient.

In my own grove, beggarweed has been the unmistakable cause of nearly all of the die-back that I have had, which has been sufficient to split and drop as much as eight hundred boxes of Tardiff oranges per year.

These bad results were realized even though every effort was made to balance the nitrogen secured by the beggarweed with potash and phosphoric acid. In short, after many years of foolish and costly effort to retain beggarweed in my grove, I found that the percentage of ammoniated and split oranges was just in proportion to the crop of beggarweed, a light crop doing but little damage, but a heavy crop of uncut beggarweed would ruin my crop of Tardiffs, in spite of all applications of potash and phosphoric acid. This damage was not done, as is often supposed, by the decay of the weed and the consequent release of nitrogen, but occurs during the mid-summer months, before the weed is fully matured, and upon soil that was during the spring deficient in nitrogen.

From the above it seems reasonable to suppose that the damage is done by the rapid nitrification going on in the roots of the beggarweed, which in turn are mingled among the roots of the orange trees. Since killing out the beggarweed by mowing two or three times per year, the die-back has disappeared.

Have seen similar results in other groves, and think that the same objection may be raised to the other leguminoid plants, such as peas and velvet beans.

*Cure:* First, remove the cause. If land is sour, use hard-wood ashes or lime. If caused by an excess of ammonia, use only potash and phosphoric acid. Avoid beggarweed or other leguminoid plants. Allowing grass or oats to grow around the tree will remove the nitrogen rapidly.

Bordeaux mixture is highly beneficial, but often necessitates spraying for scale, by destroying the fungi that prey on the scale.

### INSECTS AFFECTING THE CITRUS TREES.

Purple scale, red spider, rust mites, green soldier and cotton bugs comprise our friends, the insect enemy of the citrus in our locality.

Excepting under abnormal conditions of growth, such as occurs after trees have been killed back, scale can be largely controlled by methods of culture, fertilizing, lady-bugs and fungi; but, when necessary to spray for them, the resin compound and resin wash is perhaps our most effective wash, but is injurious to the trees if used often.

Potash soap, while less effective, will, if used repeatedly, kill off the scale without injuring the tree. But during the past year I have used a caustic potash and sulphur combination that not only kills the

red spider and rust mites, but I find also kills the young scale, even after they have moulted once, so that it eventually rids the trees of scale. I shall continue its use as a general insecticide until I find something better.

Prefer it to the potash soap, as it is effective on rust mites, which the soap is not; and I am not sure but what it is about as effective on the scale as the soap is, besides being much cheaper. Also, the potash used in it is worth about one-half of the cost, as a fertilizer.

COTTON AND GREEN SOLDIER BUGS.

The cotton bug has appeared in injurious numbers in the vicinity of St. Petersburg but twice in eighteen or more years. The green soldier bug occurs more or less every year, and, when numerous, by puncturing, causes more oranges to rot than is usually supposed. Whether the orange punctured by these bugs dries up around the puncture or rots will depend upon whether the other conditions for rotting are favorable or not. But a crop of oranges infected with these pests is a suspicious proposition for a buyer.

So far I have found no wash that will kill either of these bugs. One year, I brushed the soldier bugs into pans of water and kerosene, each man killing about two quarts of soldier bugs per day. The cotton bug, being gregarious, can be killed by hand and also trapped by using cotton-seed meal as a bait. Crushed bugs mixed with the meal make it more attractive, as the bugs prefer animal juices, even though they be those of their brothers and sisters. Possibly they might be poisoned, but they refused to eat all poison baits that I tried.

Velvet beans and cow peas are a certain means of increasing the green soldier bug, as they live and multiply upon them until the vines begin to harden in the fall, when the bugs will leave the vines and change their bill of fare to that of oranges. We had one such experience, in which two rows of trees next to a velvet bean patch lost all of their oranges by the soldier bug, and did it in spite of an earnest warfare against them.

Good-bye, velvet beans.

CYRUS W. BUTLER.

**DISCUSSION.**

Mr. Sperry—I would like to inquire from Prof. Rolfs as to the cause of dieback; whether it is caused from natural sources or from improper fertilization.

Prof. Rolfs—Either, or both.

Mr. Hart—There is but one remedy which is established for dieback and that is Bordeaux mixture. While I was attending the State Fair, two or three years ago, I had a talk with Col. Worthington and during the conversation he gave root-pruning as a perfect cure for dieback. Since then I have found evidence of same and have used it in my own case and if any one comes to me for a remedy, I always suggest that, and in every case, I have found that the trees affected are almost immediately cured.

Prof. Rolfs—Did you say root-pruning?

Mr. Hart—Yes. As you all know, dieback is very common here. It seems strange to me that it should be and I called the attention of the Society to the matter to see if the others have had experience in that line. Col. Worthington has had large experience and gave that as a sure remedy.

Mr. Carroll—About eighteen months ago I was talking with a gentleman at Bowling Green, who had trees affected with dieback and I recommended this remedy, and he found it successful. Another one at Pine Level also found it successful and in fact I do not know of any failures in this line.

Prof. Rolfs—I would like to add in this connection, that I find that root-pruning causes the tree to dry up after we are rid of

the disease. There are a great many remedies that can be used, and I have no doubt that they are good, but I think the only way of curing a tree of dieback is with Bordeaux mixture without doing any root-pruning.

Member—I would like to inquire from Prof. Rolfs if this disease occurs among other plants?

Prof. Rolfs—There are diseases that are quite similar, but as they are not as important, we have not had the time to investigate them.

Prof. Webber—We have heard a great deal about the treatment of dieback but no one has spoken of the actual cause of this disease. There is a disease of tobacco which is, I think, analogous in cause and appearance to dieback of the orange. When the top of a tobacco plant is cut off a condition is frequently brought about which is known as the "mosaic" disease. This disease is due, therefore, to malnutrition, due to cutting off a portion of the top, and the roots sending up more nutrition than the top can utilize. Of course, all of us know that after the freeze a great many groves developed dieback because the tops were not in accord with the roots and in this case root-pruning would be a good thing, and I think in ordinary cases root-pruning will generally prove satisfactory.

I have studied a good deal on this subject, and one of the most interesting cases was that one of Mr. Rals grove, a portion of which was very badly attacked by dieback due, we thought, to an affection in the soil. While we were trying to discover the exact cause of the disease in this case, the trees got entirely cured. We all know the experience of Dr. Adam in a portion of his grove, which first led him to the idea of mulching; in that portion of his grove the roots were actually crowded out of the surface, and as soon as that grove was mulched they got all right. We do not know the exact cause of dieback in every case, and when the question of treating the disease with Bordeaux mixture was first discussed, it seemed out of the question that they should be benefited with Bordeaux mixture, but, as we all know, this cure has been used with great satisfaction. I think that this disease is one of the most interesting plant diseases that I have ever had the pleasure of studying.

Prof. Rolfs—About the middle of last June, I had about 83 young trees very badly affected with this disease and some of them were hardly worth the trouble of curing. However, I tried the injecting of bluestone, and inside of 20 days they began to look much better and after a short time every one was growing nicely and there was not a sign of dieback existing. When I put it in one place, it cured only one side of the tree, but when I put it in three sides, it cured all the tree and now my trees are just as pretty as they can be and not affected in the least.

It is only necessary to use a very small quantity, otherwise it will leave a scar. About 1-8 or 1-4 of a grain makes almost no scare and produces good results. This scar will disappear in about two or three months. The best months to vaccinate with bluestone is during March and April for at that time the gum will be more settled.

I planted some orange trees on land over which there was a great quantity of palmettoes. There was about two tons of rotted palmetto on this land. One of the trees was badly affected with dieback, so I tried the let-alone policy in order to cure it. In several years it got all right and the end of the limbs were as large around as my finger. From my experience I think the bluestone injected into the tree on three sides, not on

one, is the best and most successful remedy that can be applied for this disease.

Member—What is the process of vaccinating these trees?

Prof. Rolfs—I cut a small slit in the tree, took my knife and pealed off the bark around the cut, then took a piece of bluestone about 1-4 of an inch long, insert it into the cut and then covered it up with sand.

Mr. Stephen—I would like to ask the question, whether the trees are vaccinated when the sap is rising or falling?

Prof. Rolfs—If taken early in the spring before the ground is heated and the sap rises, it will make a very small scar and will take on every tree.

Mr. Porcher—There are several of us on the Indian River who have been trying the same process, and as far as I can judge by examining the trees, with success. I agree with Prof. Rolfs that it will be found that the sap, after flowing six to ten hours, will cease to flow.

Mr. Sams—I have been experimenting with oranges for some time, but I was compelled to plant crops in part of my orange grove and on one part of the land the dieback was very bad. I sprayed my trees with Bordeaux mixture and one of my neighbors used the bluestone. I find that if the bluestone is not used very carefully, the tree will die. I stopped cultivating and stopped fertilizing for one year and let the weeds grow over the land, and my neighbor agrees with me that the best cure is to stop cultivating and let the weeds grow over the land.

A Member—I am very much pleased with this discussion. Two or three items in this discussion deeply interested me. I have been fighting dieback in one of my groves for nearly twenty-five years and I think I have got it nearly cured. I have tried all the remedies that have been suggested. I have tried root-pruning and bluestone, but I believe that the last gentleman's system of non-cultivation and the planting of palmettoes beats anything that has heretofore been given. The use of lime is beneficial in the treatment of this disease, that is, it assists the soil to such a condition that it enables it to throw off the dieback.

I have never found anything quite as successful as Bordeaux mixture and I am well pleased with this remedy as it is the easiest of application and gives really the best results.

During a conversation with Prof. Webber, he told me that this disease was not a fungus trouble and in his opinion not a sap trouble, and that whether it occured when the sap was in the tree or in the roots, he could not say. In my opinion it is a soil affection, caused by the soil, and we can overcome it by a system of non-cultivation and non-fertilization.

Mr. Benton—I wish to say in regard to the use of bluestone, that I have been experimenting in this for eighteen years in the Salt River Valley, and will say that it is impossible to grow any trees without the use of bluestone. I have used this stone here for four years. I do not stop cultivating nor the application of fertilizer, for I do not think that cultivation, (unless it might be over-cultivation) produces dieback, but I do know that the insertion of bluestone in some character will destroy the disease; I really think that bluestone should be applied during the season to every tree, whether it has been affected or not. If it has been affected, you will find that the second crop will be devoid of the blighted fruit and be in perfect condition. That is the only remedy that I know of that will really affect dieback. I do not say anything against Bordeaux mixture, that will help along, but it is not as reliable as the bluestone.

Dr. Kerr—Last year I was called away for the summer and in my grove there were

several trees that had dieback. I told my man to treat them with Bordeaux mixture. On returning in the Fall, I saw that the trees were looking well and was highly pleased with the result of this cure and was firmly impressed that this was the proper thing to do. Two months afterward, I learned that no Bordeaux mixture had been applied to them, that my man had not treated them at all, simply left them alone.

President—Next is the report of the Committee on Entomology. This committee consists of Messrs. H. A. Gossard, P. H. Rolfs, and E. P. Porcher.

Mr. Porcher—

*Mr. President, Ladies and Gentlemen:*

On this subject of Entomology I can only give you the experience of a lot of men who have studied this subject. I do not think that I should have been appointed on this Committee. My idea of a committee of this kind is, that a number should be appointed from the various sections. I think you will all agree with me that we want to grow fruit that is perfect; fruit that will present a good appearance on the market. We are well aware that an orange covered with scales has been injured for the market, although it may be cleaned and present a fairly good appearance, but still such oranges cannot be sold for first-class fruit. I do not know what others have done in this line, but you would rather hear what I have done.

If I could actually wipe out the insects from the fruit trees, the orange and grape fruit, I would think the question of the cultivation of fruit an easy one. A short time after a grove is planted out, the trees are attacked by the rust mite. We are not aware for the time being that such is the case because we expect to find the mark upon the fruit. If you will spray the trees, without any cultivation or fertilizing, they will be cured in a short time.

Four years ago, we had a grove that was very badly attacked with scales and we began spraying with sulphur. When we first began fighting the scales, we found that sulphur was the thing to use. Do any of you remember the first season when the yellow mite attacked the orange trees? A great many thought that this was the red spider, but there has never been such a thing known as a true red spider attacking an orange tree in Florida. If such a thing should happen, I would like to hear of the same. What we call in Florida the red spider is the yellow mite. This insect attacks the leaves on the under side, and it soon spreads all over the leaf and then onto the fruit and has caused the people of our section a great deal of trouble. It belongs to the spider family and although it is somewhat red in color, it is nothing like the red spider. Trees sprayed with sulphur will rarely be attacked with this insect and sulphur is the best cure for it.

I am confident that there is only one man in the State of Florida that raises oranges successfully without spraying and that is Mr. Hart. Of course, it may work on such ground as Mr. Hart's groves are planted on, but on land like mine I have to spray. In addition to this, Mr. Hart is a most careful cultivator. He certainly grows as fine fruit on his groves as there is in the State of Florida, but one of these days his time is coming, he will have serious trouble and it will not come like it does to me, in a small way, for if the rust mite ever gets into his groves, he will have to spray, as that is the only thing that can be done with the rust mite. If a man starts to spray and does not do it systematically, he will do nothing but injury to his groves. It is better not to spray at all than to do it wrong.

One of the worst affections of our groves is the white fly. I do not know but that some of you gentlemen have been troubled with that this past season?

I do not claim to have perfect groves, but I have absolutely no scale on my fruit and, with the exception of two trees, there is no sign of it on my trees. I was troubled with purple mite, but I sprayed in December until about the first week in January and we have not found a single mite since. I have also been troubled with the yellow mite, but soon got rid of that. As to the rust mite, I cannot say I am quite free from that, but I spray with sulphur and keep it pretty well down.

On the low land, I have had rust mite very badly and about 10 per cent. of the fruit attacked. I have also had a little touch of blight, and it gave me a great deal of trouble. I sprayed with a solution of copper carbonate, and it was apparently cured. A few days ago my wife and I, in going through the groves, noticed a black spot on one of the grape fruit, but it did not seem to affect the flavor.

I wish to say in this connection, a few words in regard to growing fruit. What we want to do is to grow fruit that will give the best market results. You must grow a fine quality. We are confident that on the Indian River we grow a finer quality of fruit than anywhere in the State. If fruit is sent on the market that is inferior to the fruit from California and other States, it is natural that the buyers will buy California fruits in preference to the fruit from Florida. If we can wipe out the insects that attack our trees, and grow such a quality of fruit that it cannot be equaled out of the State, we will meet with success and get the highest prices for our oranges. If an orange that is put on the market is covered with blight or has its color changed, you cannot expect, although the flavor may not be changed, to get high prices. Of course, this matter of spraying is rather expensive. The spraying of 34 acres cost me over $300.00.

Mr. Hart—In response to Mr. Porcher's remarks, I will confine my remarks to insects, as that is the question that we are most interested in. I have a different way of looking at this insect subject. Instead of railing against the common scale, I must say that it is very profitable to me. A great many growers have a good deal of trouble with the common scale, but I must say that it serves me a good purpose.

Dr. Richardson—May I inquire, in what way?

Mr. Hart—Yes. This common scale is the cause of a great deal less good fruit going into the market, and I take advantage of that by sending in the best fruit. I do not have this affection, and get the very best prices. Now, if everyone were free from scale, I could not get the price for my fruit that I do, as I would not be any exception to the general rule. Mr. Porcher raises plenty of good fruit and he does it by spraying, but I do not spray, therefore, get more profit on my fruit, as I save that expense. I have been waiting 18 years for Mr. Porcher's predictions to come true and I am still waiting. There are lots and lots of people who come to me and say, "You are all right." My fruit always brings fine prices. Mr. Hampton used to spray, but he got over it all right. One of my friends, Mr. Adams produces fine fruit, and he used to spray, but he knows better now. Rev. Lyman Phelps led me into spraying some years ago, but he also got over it, and the last time I saw him, he told me he never did spray for the common scale, and he got as high a price as anyone in the State for his fruit. This question of spraying is a very queer one and I believe that as fine fruit can be raised without spraying as can be raised with spraying. Look at Mr. Day of Oak Hill. He spends hundreds of dollars every year spraying; and there is Mr. Fred Hatch, right along side of him, who produces

*Paste this on Page 98.*

## ERRATA.

The discussion on pages 94, 95 and 96 credited to Prof. P. H. Rolfs was not submitted to him for proof reading. He disclaims any and all credit for the utterances, and further states that all of the experiments performed by him point to results quite different from those obtained by the author of the sentences credited to him. What Prof. Rolfs said was practically as follows: "I have made a number of experiments to test the efficacy of blue stone put under the bark of trees to cure die-back. For each tree treated a tree standing near by, and in as nearly the same condition as the treated tree was left untreated. The cultivation and other treatment of the trees being kept up in exactly the same manner as if no tree had been treated. In every instance the untreated tree recovered as promptly as the tree that was treated."

*Paste this on page 99*

## ERRATA.

### CITRUS PESTS.

A brief paper was presented by Prof. P. H. Rolfs after the foregoing paper by Mr. Porcher, and may be represented by the following brief outline.

1. The spider mites affecting the orange tree, including the so-called red spider and purple mite.
2. The rust mite.

In this paper it is pointed out that these parasites are especially sensitive to the effect of sulphur and sulphur combinations, and it is pointed out that they are the most easily controlled by the use of insecticides in which sulphur or some of its combinations form an important basis.

equally as fine fruit and never spends a cent for that purpose. How do you account for that?

About the location of my land. Mr. Porcher made some remark as to the location of my land being different from his land, and thus I did not have to spray. My land is near the river, that is, has the river on one side. Now, Mr. Porcher's land has the river on both sides. Mr. Adams' grove is on pine land. Mr. Wilson of New Smyrna, is on low hammock land and Mr. Gillispie here does not spray, he does not believe in it. I can name any number of them here who do not spray and yet are successful. Of course if a man has a few trees it is not expensive to spray, but where a man has 200 or 300 trees or more, the non-spraying method is the one for him. If you have one tree out of a grove that looks bad one season, by spraying for an indefinite number of years that tree may get well, but in the meantime you have killed the fungus and lady-bug that will destroy the insects in a quicker time than all the spraying you can do.

As I said before, I have been patiently waiting all these years for that disastrous time that Mr. Porcher alluded to, but I do not feel alarmed, for I have found I am as free from scale each succeeding year as I was the last. Any one who will look through my grove will find less common scale than in any grove in the State of Florida, and if I am not mistaken, I have as fine looking groves as anyone.

Now, about purple mite. About three years ago, I had them badly in my grove, but I did not spray for them. Last year they were very much less and this year they are nearly all gone. If I had sprayed, there would have been more of them, from the fact that I would have killed the fungus and lady-bug that holds it in check.

## AFTERNOON SESSION.

Thursday, April 28, 2:30 p. m.

President—Now, Ladies and Gentlemen, the first on the program is the report of the Committee on Necrology. This committee consists of Messrs. C. T. McCarty, Prof. H. H. Hume and E. O. Painter.

### REPORT OF COMMITTEE ON NECROLOGY.

Mr. McCarty—

*Mr. President, Ladies and Gentlemen:*

Our committee has felt quite unequal, this year, to the task that has been put upon us, of presenting this report. We feel this task, this year, because we are called upon to report the death of one of our most loved and distinguished members of our Society. It has been a great cause of sorrow to all the old members to note the number of familiar and loved faces who are absent from our meeting this year. It is with the most profound feeling of sorrow that I speak of the death of Mrs. Taber. It would be impossible for me to tell of the pain it has caused our Committee to speak of this great loss; we have undertaken to present a memorial page for her that will appear in our annual report. This is but little to express our feelings but it is all we can do.

I must speak of another loss, another familiar and loved face missing from our number. We miss the faithful, silent man, who used to sit at this table, willing to forego the pleasures of the session, the pleas-

ure of being in our midst, but ever ready to stand back in order to give the Society the benefit of his efficient services, taking all that was said and done at these meetings. We miss the scholar, the historian, the man who discarded what was not good and preserved that which was of worth in the proceedings of our Society. We indeed feel that we have sustained a great loss, and we are called upon to present a memorial page and while we have tried to get him a fitting memorium, simple but worthy of this honored member, we feel that the best we could get, little expresses our feelings of sorrow.

I have the painful task of presenting to you the death of three other honored members of our Society, Col. W. R. Anno, Lucius S. Eldred and William H. Tancre. This will make a list of five members who have departed from us.

### WM. H. TANCRE.

Wm. H. Tancre was born in 1833, in the province of Alsace-Loraine, and came to America while still a boy, residing in Watertown, Wis., for several years. At the end of the Civil War, he went to Alabama. He was appointed receiver of the United States land office during the Garfield-Arthur administration, and was so highly regarded that he was re-appointed by President Cleveland, serving eight years.

Mr. Tancre came to Florida fifteen years ago, locating at Ankona, where he developed a very fine orange grove and pineapple plantation. His home was the scene of many pleasant entertainments, and he was extremely popular with all the residents along the Indian River. His wife and one son and daughter remain to mourn the loss of a noble man.

(See memorial pages 111-113.)

Mr. Tancre died at his home at Ankona, December 20, 1903. Interment was at the Ankona cemetery, where very impressive Masonic ceremonies were performed.

### LUCIUS STUART ELDRED.

Lucius Stuart Eldred was born April 14, 1834, in Green county, Illinois, and would have been seventy years old had he lived a few months longer. He spent his early life in agricultural pursuits, and in 1881 moved to Carrollton, Ill., where he engaged in the hardware and furniture business. In 1881 he was elected mayor of that town, and was strongly identified with its progress while living there.

Mr. Eldred was a prominent member of the Pineapple Growers' Association, and a member of the Board of Directors for many years. He was prominently identified with the developments of the pineapple region.

His death occurred at his home, Eldred, Fla., December 9, 1903. The interment was at Carrollton, Ill., where all his family have lived for two generations.

### COL. W. R. ANNO.

Col. W. R. Anno was born at Petersburg, Ill., December 25, 1844, and removed to Maysville, Ky., where he was Clerk of the Circuit Court, and later practiced law. He was prominently identified with the Democratic press in the State before and during the Civil War. He came to Florida in 1870, on account of failing health. He removed to Miami from Orlando in 1899, where he took a prominent position at the bar. His death occurred at Miami, March 3, 1904. The members of this Society, who listened to his eloquent words in welcoming us to Miami last year, will all unite in generous tribute to his memory.

President—The next report is the report on Nut Culture—Major Geo. R. Fairbanks, Mrs. C. W. Jacocks and H. S. Graves.

### NUT CULTURE.

*Mr. President, Ladies and Gentlemen:*

In reporting on the subject of "Nut Culture," I will confine myself mainly to the pecan, believing it now stands at the head of the list of edible nuts. A variety of walnuts, both English and Japan, have been planted in a small way, as well as the American, Japan and Spanish chestnut, and the almond, but none have proven of sufficient value for extensive planting, at least in Florida.

We believe it possible that some cross or hybrid of these nuts can be obtained, that will prove worthy of orchard planting, but in our opinion it will need something very superior to cope with the now well established pecan.

The subject of nut culture has had full and able reports in former meetings of this Society, and to go over the ground again of selecting trees and soil, and proper care to be given, would only be to repeat in the main rules already laid down. However, there are some rules that will bear repetition, and some of them apply to nut culture. In the selection of trees for the orchard, it is now quite universally conceded that only genuine budded or grafted stock should be used. It came very hard for some growers to give up advocating the fine selected seedling, and a few still cling most tenaciously to the old and false theory that a choice nut planted would reproduce itself. The ease of growing, and ability to dispose of seedlings at from one to three dollars each, as against the budded or grafted tree, of unknown percentages, we fear has had too much influence. In the selection of land, that having plenty of subsoil moisture is most desirable, and have no fear that the most fertile you have is too good for the purpose. Good results can be obtained on any lands that will produce fair crops of corn or cotton, if fertilized. Regular farm crops can be planted between the trees; we would not plant oats or rye. Reserve sufficient room along the orchard rows so as to give thorough cultivation, which they should receive some later than early maturing crops. Mix with the soil one to two pounds of pure bone meal when the tree is planted, excepting ground is naturally rich. The ordinary fertilizer would be lost before the growing time in early planted stock.

In correspondence with a noted horticulturist of Texas, he stated that, "The pecan is a wild and untamable tree and abhored cultivation."

It may be true in Texas, but it certainly is not in Florida, as the better care is bestowed on the orchard the better the results.

Again, the pecan varies from the fruit trees in that size is more essential than age. Few trees will bear under twelve to fifteen feet in height. Hence, if we can, by either planting upon a rich soil or by the liberal use of fertilizer, force the pecan to this size at three to five years from the bud or graft, we can expect it to produce. Will pecan growing be overdone? We do not think so, so far as the high grade nuts are concerned. Comparatively few people yet know of the vast difference between the small, thick-shelled and often bitter specimens, and the large, rich and easily separated kernel of the choice varieties. Even with the very ordinary nut as now marketed in quantity, the wholesale price is today greater than fifteen years ago, and the finer varieties have not yet reached the general market.

No one who attended the meeting of the

National Nut-Growers' Association, held in New Orleans in October last, could but be impressed with the importance of the industry and deep interest shown. Every moment of the three days' session was filled with reports, papers and discussions of value to the industry. This, the second meeting of the Association since formed, was well attended by representatives from South Carolina to Texas, and as far north as Missouri and Illinois, and from the practical side of nut growing the subject was most thoroughly investigated and ably discussed. We had with us representatives from five or more Southern colleges, and from the Department at Washington, D. C., who gave splendid aid in helping to place the work of the Association on a firm and stable foundation.

The exhibit of nuts embraced most of the leading and well known varieties of pecans as grown and propagated from Florida to Texas.

One exhibit of one hundred and sixteen samples from a seedling grove grown from choice nuts, and no two alike, we think must have been shown for the express purpose of chilling the man who still believes a choice nut planted will make a choice grove. Unfortunately the convention was held too early to give fair test as to quality of varieties shown, few being dry enough. This trouble will be obviated at the next meeting, which will be held in St. Louis October 26-28, 1904, as last year's crop will be held in cold storage and so be in proper condition to test. The most important report of the New Orleans convention was the one on nomenclature and standards. The need of this measure for judging the pecan has been apparent for some time, as several names have been applied to one nut, several bearing the same name, and a still greater number propagated that possessed no especial point of superiority over existing ones, increasing the difficulty to select for planting. As nut culture is one of the recognized branches of pomology, it will be governed by the same code in establishing its standard. We regret we have no statistics at hand to show the volume of or increase in nut culture at this time, but trust such data, if not now available, will be formulated for use in the near future. In conclusion, let us state that we deem the subject of nut culture as being worthy of our best efforts; and instead of trusting that time will bring to us some chance seedling of merit, whether it be from any one of the nut tribe, let us take up the work of endeavoring to improve what we already have. If we cross-breed other fruits and by careful selection obtain something more desirable, why not with the pecan? We are constantly trying to raise the standard of other fruits; why not apply some effort toward producing our ideal in nut culture?

It may be a long road to travel for questionable results, but let our efforts be such that those following may see wherein our labor has not been entirely in vain.

H. S. GRAVES.

### PECAN NUTS.

*Mr. President, Ladies and Gentlemen:*

It is not my purpose to inflict upon you a long-drawn-out article on this, to me, a most fascinating branch of Horticulture. Being of a nature that has no inclination to run other peoples affairs or business, I am not prepared to report upon this industry, except in so far as my own personal successes and failures go; and thinking this might be a source of interest to some of you, I will briefly relate some of my experiences. The nuts from which originated my several varieties of pecans, were planted fourteen years ago. These seedling trees are now 50 to 70 feet high, with a spread of 40 to 50 feet; they are now setting their

eighth crop of nuts. Since beginning to bear, each crop has been a full regular one; although I have cut heavily of graft wood from these trees, yet I gathered from individual trees, last year, 75 to 125 pounds of nuts, the qualities of which a good many of you are somewhat familiar with.

In March and September, 1901, I worked over a grove of 4 and 6 year old pecan trees, by grafting and budding with my choice varieties; some of these grafts bore in 1902; from one graft I picked 20 fine nuts, while in 1903 numbers of them bore—one bud, 205 nuts, which weighed 5 1-2 pounds; and a single graft bore a peck. Photos of these trees are on exhibition at this meeting. These are only single instances, as I have dozens of these buds and grafts now bearing.

I do not give these items in order that I may here advertise my business, but I was asked to prepare a report, and as I was not familiar with any but my own, I thought I would give it, such as it is, or as much of my experiences as are past the experimental stage, for many of my methods are original with me, and I would not dare give them as examples for others to follow. What I have done, others can do, and with care in selection of trees, proper fertilization, soil conditions, etc., all these being satisfactory, I see no reason why anyone cannot make a success of pecan growing; and should you go into it, either for profit or mere pleasure, or both, you will never regret the day you planted your pecan grove. And now, as demonstration is more in my line than speechmaking (the handsome cluster of grape fruit and little jar of pecans on the desk there will do their own talking), I will say in conclusion, that if any of you wish to ask any questions of me, in regard to my ideas and experiences in this industry, I will cheerfully give you as clear and concise information as I am able to give.

MRS. C. W. JACOCKS.

## STRAWBERRIES.

*Mr. President, Ladies and Gentlemen*:

The growing of strawberries in South Florida, during the season just closed, has perhaps been fully as prosperous as that of former days. The acreage planted has been much less, but the plants have been more prolific and the amount of strawberries shipped has, as far as I could learn, been quite an average.

Prices might have been better during the early part of the season, but the long continued freezing weather in the North was not conducive to a large consumption of strawberries; hence the prices were very low. Towards the end of the season the prices improved, so that in March we were selling in Boston at forty, forty-five and fifty cents per quart.

At the last yearly meeting of this Society, I reported Brandywine as the leading berry, and spoke of the Klondike as likely to improve on closer acquaintance. This has turned out so, and, although the berries are not quite so large as the Brandywine, they are large enough for all purposes, thirty frequently filling a quart basket. The Klondike plant is much hardier than the Brandywine; even a light freeze does not hurt the bloom or young berries, when the Brandywine plants would have all the bloom and young berries destroyed. Again, this plant does not seem to be subject to leaf spot or blight, and red spider has not attacked any of them in our strawberry gardens, when, on the other hand, Brandywine has to be treated for both of these pests. It is, however, later in maturing than Brandywine, and neither will at all compare in earliness with the Excelsior, which bears a much smaller berry, but is so prolific that the yield is even greater per acre, and very much earlier than all other varieties. We began shipping on the 14th of December last year, and none

of the other varieties were sufficiently matured to bear a full crop until February.

The Lady Thompson berry is still a favorite in some sections of the State. The Hoffman also bears off the palm in others. But we have had only moderate success with either.

The old Newnan and Early Michael are still adhered to by many growers. The last named variety is excellent for home use, but too soft to be a good shipper.

The Heflin, a new variety, is highly praised by those who have it for sale. We are testing it in our nursery. There are numberless new varieties coming out every day, whose names I do not know, but I have mentioned those that are generally most successfully grown in Florida.

R. K. MUIRHEAD.

### FIGS.

*Mr. President, Ladies and Gentlemen*:

I corresponded with Messrs. Bacon and Terrell, the other members of our committee, and, if present, Mr. Bacon was to report on "Grapes" and Mr. Terrell on "Kaki." My report on "Figs" will be very brief, as I find but little that can be added to the reports made to this Society in previous years.

It would seem, from the account in the Bible, that the first commercial use made of the fig tree was in the Garden of Eden, in the manufacture of aprons, by the firm of Adam and Eve, who supplied the entire population until the advent of Cain and Abel.

Just *why* they should have selected the small, irregular leaf of the fig for such a purpose does not appear.

Where Eden was, no one has seen,
  But many places fill the bill;
It might have been at *Tangerine*,
  Or possibly at *Jacksonville*.

Was Adam, then, so very bad,
  To want the best to eat?
Why, friends, we all would sure be glad
  To sometimes have a treat.

He got a "fall" and lost a "rib," (?)
  And in the muss and clatter,
It matters not which told the fib;
  A woman came—that's what's the matter.

And with her love, and smiles, and cheer,
  Who, still content, the "garden" digs,
Will rob the *legend* of its *fear*,
  And *bless* the toil that gives us "figs."

The fig seems to be indigenous to Asia Minor and Syria. The Greeks are said to have received it from Carica, and it was one of their principal articles of sustenance, especially with the natives of Western Asia and Southern Europe.

Mashing up the inferior kinds serves as a substitute for *bread*, and when mixed with almonds, a similar preparation is sold as a luxury in the large towns, under the name of "fig cake."

Our supply of figs comes from Asia Minor, the Spanish peninsula and the south of France. Those from Asiatic Turkey are considered the best.

The fig is a gentle cathartic when eaten abundantly. It is also a good poultice for boils and sores.

In India it is chiefly planted with a religious object, being regarded as *sacred* by both Brahmans and Buddhists. The former believe that the *incarnation* of *Vishnu* took place beneath its shade.

It is said to have been a branch of this tree under which Gautma Buddha became endued with his divine powers.

Figs are propagated by *cuttings*, or better, by *layers* of two or three year old shoots, which, when well rooted, will bear fruit in one or two years. This can be

done so easily that no Florida farm should be without them, selecting the variety that seems best adapted for each locality.

WM. H. EARLE.

### KAKI.

*Mr. President, Ladies and Gentlemen:*

It is not the object of this report to enter into any scientific details or nomenclature. But if one kaki tree will be caused to flourish where none, or a wild persimmon, grew before, the committee will feel amply paid for any service it has rendered. The appeal is not to the nurseryman or to the professional fruit grower, for they already know the value of these fruits, but to every land owner in whose soil the persimmon will flourish, and is there an acre of arable land in the State that will not do this? They are growing wild in every county from southern Dade northward, if not in every State south of the Ohio River.

The varieties bearing the larger fruits are perhaps the most satisfactory, but there are several improvements on the native persimmon which are well worth the time and space devoted to them; and when one becomes a persimmon-eater, he is willing to devote both time and gastronomic space to disposing of the fruit.

The fruiting season lasts nearly half the year, commencing with the earliest Zengis and native sorts and ending in February, when the last fruits—picked and laid by—are eaten.

We might mention three modes of propagation: First, from seed, to improve the native kinds and to produce new varieties of the kaki. Second, by grafting while the trees are dormant; and, third, by budding. This last method may be the most satisfactory to the farmer who wishes to utilize the small trees coming up about the place, by inserting buds from well-formed but not yet hardened wood, into growth of the same nature, he will have little trouble about the buds taking. The wound being smaller than that produced by grafting, there is less liability of disease attacking that point, and of the new wood being broken by wind. Some say that no cultivation is necessary, and it is certainly true that this is a splendid fence-corner and ditch-row tree; but cultivating, mulching and fertilizing will pay every time.

As to enemies, the kaki has few. Sometimes the "borers" disturb the roots or the wound made by grafting does not properly heal and "sawyers" enter the decayed wood and in time kill the trees. A good medicine for these is the jack-knife properly applied, then tar to keep the rascals out. Perhaps the worst enemy is to the fruit—the mocking bird—and the remedy is more persimmons, so that there is enough for him and you.

"Tell me what you eat, and I will tell you what you are;" and this is the "fruit of the gods." What glorious possibilities! When one sits down with an honest appetite for persimmons, his only regret is that there are limitations, not to the quality of the dish, but to his own capacity.

There may be other uses for the fruit than to serve it uncooked, but, like the darkies' watermelon, there seldom remains any to experiment with.

Served with cream, it will keep you guessing whether the kaki showed you the value of the cow, or whether bossie has taught you the greatest joy your inner man has known.

C. M. TERRELL.

Hastings, Fla., April 12, 1904.

### ELECTION OF OFFICERS.

The following officers were elected for the coming year:

President—G. L. Taber, Glen St. Mary.

Vice-Presidents—Geo. L. Wilson, Jacksonville; Dr. Kerr, Pierson; and F. D. Waite, Palmetto.

Secretary—E. O. Painter, Jacksonville.

Treasurer—W. S. Hart, Hawks Park.

Executive Committee—E. S. Hubbard, Federal Point; Lyman Phelps, Sanford; and C. T. McCarty, Eldred.

### NEXT PLACE OF MEETING.

The invitation of the Jacksonville Board of Trade to hold the next annual meeting in Jacksonville was accepted by the Society.

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## EVENING SESSION.

Thursday, April 28, 7:30 p. m.

Dr. Kerr—I wish to offer the following resolution:

*Resolved*—That we, the members of the Florida State Horticultural Society, respectfully request the officers of the several Railroad Companies of the State to grant transportation free to those persons engaged in looking after the diseases and insects peculiar to the fruits and fruit trees and vegetables of Florida; and also to the officers of Express Companies to carry specimens for examination at laboratories free.

Now, Mr. President, This proposition should go to a committe consisting of residents of this place. In this connection I will say that I have seen the Assistant General Passenger Agent of the S. A. L., and had a very pleasant conversation with him and told him what we were trying to do, and that the gentlemen connected with the Society were working just as much for them as any member of the Society and he promised to do what he could. Capt. MacDonell told me that he was favorably disposed to it and that he would do anything that could be done and that the railroad would take hold of the matter without delay. I do not think there is a particle of doubt but that the request will be granted, but it would be necessary to have it authorized by the Society and signed by the President and Secretary before the transportation is granted.

President—I would like to say, if the Doctor will let me, that I spoke about this committee being appointed. I would propose, in this connection, after the resolutions are turned over, that the Executive Committee put them in effect. The motion is herewith seconded and carried.

Mr. McCarty—While we are on the subject of resolutions, I would like to present the following:

*Resolved*:—That the State Horticultural Society expresses its regrets at the inability of Rev. Lyman Phelps, a member of the Executive Committee, to be present on this occasion. We have missed him from our number and hope that he will be able to be with us on our next meeting with renewed health and vigor.

(A motion is made, seconded and carried for the adoption of the above resolution.)

**TREASURER'S REPORT.**

| | |
|---|---|
| May 6. To balance on hand at last report | $ 660.38 |
| May 6. Memberships received | 1.00 |
| June 13. Memberships received | 3.00 |
| 1904. | |
| April 28. Received of Assistant Secretary Frink | 400.00 |
| | $1064.38 |

| 1903. CR. | |
|---|---|
| May 7 and 8. By paid rebates on railroad fares | $ 34.31 |
| July 15. Secretary Powers, Draft No. 27 | 477.60 |
| July 15. Secretary Powers, Draft No. 28 | 110.67 |
| 1904. | |
| April 28. Balance in Treasurer's hands | 441.80 |
| | $1064.38 |

W. S. HART,
Treas. F. S. H. S.

*Approved*:
E. S. HUBBARD,
E. O. PAINTER,
LYMAN PHELPS,
Per G. L. Taber, proxy.

**REPORT OF EXECUTIVE COMMITTEE.**

*Mr. President, Ladies and Gentlemen:*

The Executive Committee has the honor of submitting the following report: After the last annual meeting Secretary Powers was authorized by concurrent correspondence with the Executive Committee, to make the most favorable arrangements for getting out the proceedings, and his bills for this purpose were approved.

A meeting of this Committee was held at the Windsor Hotel, March 18, 1904. Present: President Taber and Messrs. Hubbard and Painter. Action was taken in regard to fixing date for the present meeting and President Taber's appointment of Mr. Aubrey Frink as Acting Secretary, owing to the illness of Mr. Powers, was approved and meeting adjourned.

After Mr. Powers' death, Mr. Taber's appointment of Mr. Aubrey Frink as Secretary and Mr. E. O. Painter as Assistant Secretary were approved by correspondence.

A meeting was held at the Windsor Hotel, April 28th, 1904, at 4 p. m. Present: President Taber, Secretary Frink, Treasurer Hart, and Messrs. Hubbard and Painter, of the Committee. The vouchers of the Secretary were approved and the Treasurer's account was audited. After a general discussion as to ways and means, the meeting adjourned.

REV. LYMAN PHELPS,
Per G. L. Taber, proxy.
E. S. HUBBARD,
E. O. PAINTER,
Executive Committee.

April 28, 1904.

**FINAL RESOLUTIONS.**

*Mr. President, Ladies and Gentlemen:*

Your committee beg leave to report as follows:

*Resolved*, That the thanks of the Society be tendered the Jacksonville Board of Trade for many courtesies, among which we may especially mention the use of their beautiful auditorium in which to hold our meetings, the pleasant excursion on the St. Johns River on the 26th, and the delightful musicale on the evening of the 28th. In connection with this latter enjoyable event we desire especially to extend our thanks to those who have taken part in the entertainment.

*Resolved*, That we tender our thanks to the press of Jacksonville and Florida, par-

ticularly the Times-Union and Citizen and The Florida Agriculturist, for notices of the meeting and the full reports which they have published.

*Resolved,* That we express our appreciation of the services done by, and extend our hearty thanks to the local committee, E. O. Painter, Chas. R. Tysen, Geo. W. Sanders and Lorenzo A. Wilson.

Our stay in Jacksonville at this time has been very pleasant, and we shall carry with us delightful remembrances of the kindness extended to us by the Board of Trade and the citizens of Jacksonville.

H. HAROLD HUME,
E. S. HUBBARD,
W. C. RICHARDSON.

President—We are now ready to hear the report of our Committee on Ornamentals, consisting of Mrs. E. O. Painter, Mrs. A. H. Brown and Miss Mary Van Dyke.

Mr. Painter—Mr. President, I would like to congratulate you on your ability to secure papers for the Horticultural Society. For twenty-one long years I have been trying to get my wife to write something on Ornamentals for publication in our own paper, but without success. On receiving your request for an article, she consented to write the same, providing I would read it; therefore I present you her paper on Ornamentals, and will read same for your edification.

**ORNAMENTALS.**

*Mr. President, Ladies and Gentlemen:*

I have been wondering ever since I received a letter from the President informing me that I was Chairman of the Committee on Ornamentals, why I was selected out of so many who were so amply able to give the Society a paper that would truly be worthy of a place in the minutes and give information that would be valuable to the members. I say this because I have never before written a paper to be read before an Association or for publication. But they say it is the hard and unpleasant tasks that do us good, therefore I hope that all will derive some benefit from what little experience I can give you.

When I left DeLand, where I had five acres of land to move and work in, and knew that I could plant seed, hoe my shrubbery, or pluck flowers without any fear of my neighbors knowing whether my sleeves were turned up to my elbows or whether I worked with my bare hands or covered them with rubber gloves, I could not see how I should ever have any flowers in the little yard that surrounds my home in this city. The yard seemed so small that I felt that I could hardly move without getting off our boundaries, but "where there's a will there is a way," and I soon found that we can have a little of the beautiful even in a small yard in Jacksonville.

The first thing I did after coming here to live was to make a flower bed the length of the back fence and about three feet wide. I sent off and secured twenty roses of the $1.00 collection and the same number of chrysanthemums and planted them in the space referred to. I worked with these plants until my chrysanthemums stood from eighteen inches to three feet in height. Many of these I disbudded, thinking I would have a better show of flowers. All things have their setbacks and our fondest hopes are sometimes rudely shattered. While I was looking forward with happy anticipations of seeing my chrysanthemums bloom, the buds having swelled so large that it seemed only a day or two until I would see the beautiful flowers unfold. But, alas! Halloween night the bad boys of our neighborhood concluded that total disbudding was better than partial disbudding, and therefore my labors had so far

been in vain with the exception of the knowledge gained that chrysanthemums could be raised even in a small yard. You can well imagine my disappointment, and if tears could have restored the buds I could surely have shed them. Not to be discouraged, I tried again, and in January I planted more roses, only the smallest ones for I like to work with them and see them grow. A few pansy plants were set out along the border, but these received the same fate as our chrysanthemums. But still I was not discouraged, I had the fun, one day, of seeing one of my neighbors chase one of the "good" boys who was plucking flowers, but it is needless to say that the boy was too fleet of foot for his pursuer.

The third attempt was more encouraging, as I had threatened the boys with the police, and since that time, with but one or two exceptions, my flowers and plants have been unmolested by the tireless, ever-present, Small Boy.

I often think if mothers would only let the children have a little plot of ground and give them a few seeds of the ornamental kind, they would be better able to keep their children at home and prevent them from disturbing the plants of their neighbors, for what child is there who does not love flowers?

Around the home might be planted at a very small cost a bed of nasturtiums, verbenas, larkspur, balsam, zinnias, sweet alyssum, ageratum, and pansies. Many seedlings have only a short period of blooming, but by a proper selection they could keep something blooming on all the time to give color and beauty to the garden. One good plant is the flowering sage, salvia, always filled with scarlet flowers, lasting until the frost cuts it down. Another beautiful plant is the orange cosmos with its dark orange blossoms that last into the fall. Sweet alyssum is a self-sower and seldom ever runs out. The zinnia of our grandmother's garden has been improved until some of them are as beautiful as the dahlia. The dahlia comes on late in the summer and blooms until late in the fall.

I will now tell you about some bulbs that were sent us from the Department of Agriculture, consisting of thirty tulips, six hyacinths, and two narcissus. My hyacinths and narcissus gave me spikes of bloom that were greatly admired by all who had the privilege of seeing them. The tulips, I regret to say, simply did no good at all.

One of my neighbors brought me a large bunch of snowdrops early this spring. This simply shows that there are so many plants, bulbs and shrubs that no one need be without flowers even in the small city yard.

We have many fine varieties of cannas that can be planted close to the house or along the porch, whose leaves and brilliant flowers are the admiration of all lovers of plant life. One can have a good sized bed of gladiolas, as no plant is easier to raise. Give it good soil, plant about four and a half or five inches deep. Their coloring is very rich and will repay you for the care and attention given them. Every one should have their violet bed, if it only consists of a dozen plants. They are among the first to greet us in the spring, and their fragrance is excelled by few flowers.

For foliage plants, nothing gives better satisfaction than a large bed of coleus, some of the improved strains giving very large leaves of all the colors of the rainbow. The miniature sunflower is also a good plant, blooming all summer until the late fall.

Who has not noticed with pleasure the large beds of phlox growing along the roadside, made up of flowers from purest white to the beautiful blending of all the colors? The star phlox, I think is the most

beautiful, with its fringed petals and delicate penciling of colors. Any varieties of poppy or aster, planted early, do well, in fact, I know of very few annuals that I have planted early and given good care but will give ample satisfaction for the labor bestowed upon them.

I have spoken briefly of annuals because they seem to be more thoroughly adapted to be grown in the small yard of the tenant's houses of the city, but I would add a word for the roses. Plant all of them you can get. There are but few varieties but that do well if taken care of. The teas have always been most satisfactory. The climbers give more flowers for your work. The hybrid will grow, but they do not bloom freely, only giving you their fragrance once or twice a year.

There is one thing that is essential to making a success of raising the ornamentals, whether in the city where you have limited space or in the country where you have acres, and that is the love of flowers and the desire to see Dame Nature unfold her beauties from day to day, and the belief, that in some way, notwithstanding disappointments may come in the shape of small boys or otherwise to upset your calculations, that through perseverance one will finally receive the reward of his patience by seeing flowers unfold their beautiful petals and give their delicate perfume in payment for the work and time spent on them.

MRS. E. O. PAINTER

Mr. President—This now finishes our entire program, with the exception of the Musicale, which is tendered the Society by the Board of Trade and the citizens of Jacksonville. A motion to adjourn is now in order.

Adjournment.

The Society was most delightfully entertained by the Musicale, and each member went home well pleased with the hospitality of the people of Jacksonville, feeling that they would be glad to return one year hence.

GERTRUDE ST. JOHN TABER

# In Memoriam

GERTRUDE ST. JOHN TABER

Wife of George L. Taber, President of Florida State Horticultural Society

Born February 10, 1843 — Died July 22, 1903

GERTRUDE ST. JOHN TABER

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## GERTRUDE ST. JOHN TABER

Wife of George L. Taber, President of Florida State Horticultural Society

Born February 10, 1843 — Died July 22, 1903

# In Memoriam

## STEPHEN POWERS

JOURNALIST, HISTORIAN, HORTICULTURIST

Born July 22, 1840 — Died April 2, 1904

Secretary Florida State Horticultural Society,

1899 to 1904

(See Frontispiece.)

# In Memoriam

## William H. Tancre

Born 1833 — Died December 30, 1903

## Lucius Stuart Eldred

Born April 14, 1834 — Died December 9, 1903

## William R. Anno

Born December 25, 1844 — Died March 3, 1904

# FLORIDA
# STATE HORTICULTURAL SOCIETY.

# CATALOGUE OF FRUITS.

# 1904.

# CATALOGUE OF FRUITS.

## ADOPTED BY THE SOCIETY AT THE SEVENTEENTH ANNUAL MEETING.

In making a complete Catalogue of the Fruits of Florida, indicating intelligibly, in summarized and tabular form, the relative value of varieties for different sections, the wide-stretching territory, diversity of soil and climate, and the limited range of each of the numerous fruits, render it essential that the State be divided, so that regions allied throughout in their adaptability to fruits may be designated and referrred to.

To this end, four districts have been formed, as described below. Geographical lines cannot be made to indicate pomological conditions with accuracy. More than approximate correctness could not be expected from an arbitrary division of this kind, especially where local conditions vary so greatly as in Florida. Working by general averages, some sections are unavoidably left in the wrong districts, judging by the standard of local conditions. The divisions, however, will be found to answer their purpose better, than any that could be made without further sub-divisions, which would be impracticable.

WESTERN NORTH FLORIDA—That part of the State west of the Aucilla river.

EASTERN NORTH FLORIDA—That part of the State between the Aucilla river and a straight line drawn across the State from the mouth of the St. Johns river to Cedar Keys.

CENTRAL FLORIDA—That part of the State between the line above referred to and the counties constituting South Florida.

SOUTH FLORIDA—The counties of Brevard, Dade, Monroe, Lee, DeSoto and Manatee.

H. HAROLD HUME,
E. N. REASONER,
W. S. HART,
Committee.

# EXPLANATION OF ABBREVIATIONS.

The abbreviations and signs used in the columns which appear in the ensuing pages signify as follows:

ORIGIN—Of variety or species. (Refers to species, race, or geographical derivation, as best calculated to define.)
- A., American.
- E., English
- E. I., East Indies
- F., Foreign.
- H., Hybrid
- J., Japanese
- N., Originated in Florida.
- O., Oriental.
- S. A., South America.
- W. I., West Indies.

ORIGIN—(Referring to sweet oranges only)
The origin of oranges is given to conform as nearly as possible to the preponderance of influence evidenced of the particular strain or its probable wild ancestry: *Sev.*, Sweet Seville or Sweet China; *St. M.*, St. Michael or Portugal; *Mal.*, Malta Bloods, their progeny and kindred.

ORIGIN—(Referring to peaches only).
- H., Honey race.
- N. C., North Chinese race.
- N. O. B., New Oriental Bloods.
- Per., Persian race.
- P-to, Peen-to race.
- S., Spanish race.

ORIGIN—(Referring to grapes only).
- A., Aestivalis.
- L., Labrusca.
- R., Riparia
- V., Vulpina

SEX--Of variety. (Referring to strawberries only).
- b, bisexual.
- p, pistillate.

USE—Of fruits.
- d, dessert, eaten without culinary preparation.
- c, culinary, including drinks, confections, condiments and domestic and manufactured preparations for gustatory use.
- s, shipping, for general market; good long-distance carrier.
- n, near-by market only. (Because of restricted demand or poor carrying qualities.)
- a, All purposes named above.
- w, Wine. (Referring to grapes only.)

SIZE—Of fruit.
- l, large
- m, medium.
- s, small.
- v, very.

FORM—Of fruit.
- b., blunt, obtuse.
- c., conical.
- e., elliptical.
- f., flattened (oblate).
- h., heart-shaped (cordate).
- k., kidney-shaped (reniform).
- l., lemon-shaped.
- o., ovate.
- ob., obovate.
- ol., oblong.
- p., pyriform.
- pt., pointed apex.
- q., quarter-marked.
- r., round.

FORM—Of bunch (applies to grapes only).
- br., broad.
- cl., cylindrical.
- cp., compact.
- sh., shouldered.

COLOR—Of fruit, except as to peaches, where it refers to flesh. Use adjective or noun according to application. Thus, r. stands for "red" or "reddish"; r. y., "reddish-yellow"; r. and y., "red and yellow" (as a yellow fruit with red cheek or other red markings).
- b., black.
- bl., blue.
- br., brown.
- bz., bronze.
- c., crimson
- cr., carmine.
- d., dark.
- g., green.
- l., light.
- o., Orange (not a shade of red, but the color of ripe oranges).
- p., purple.
- r., red
- s., salmon
- sc., scarlet.
- v., violet.
- w., white.
- y., yellow.

CLASS—Of fruit.
- C., clingstone.
- F., freestone.

QUALITY—Of fruit.
b., best.
f., fair.
g., good.
v., very.

FLESH—Of fruit (applies to strawberries only).
f., firm.
m., medium.
s., soft.

SEASON—Of ripening of fruit.
e., early.
ev., everbearing.
f., fall.
l., late.
m., medium.
s, summer.
sp., spring.
v., very.
w., winter.
(v. e., "very early"; L. M, "late medium," etc.)

VIGOR—Of tree, vine or plant.
g., good grower.
m., moderate grower.
v., vigorous grower.

PROLIFICNESS—Of tree, vine or plant.
f., fair bearer.
g, good bearer.
p., prolific.
s., shy.
v, very.

ADAPTABILITY—Of variety or species to region named.

(*) One star—recommended for region named.

(**) Two stars—especially well adapted and desirable.

(†) A dagger—new, recently introduced, or but little known, and promising.

(—) A dash—not adapted, or found undesirable.

( ) Blank space—no mark or sign in "Adaptability" column indicates that no report has been made.

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# CITRUS FRUITS.

## SWEET ORANGES—Citrus aurantium.

NOTE.—The development of orange culture in this State has given rise to a multiplicity of varieties, many of which, while meritorious, have no distinctive qualities, or superiority, as compared with others. It has been deemed advisable to omit the names of many varieties which have disappeared from cultivation. The list, however, is still large.

The names in heavy type are designed to constitute a complete list for the State, embracing varieties of the highest excellence in all the desired characteristics of season, quality, distinctiveness, productiveness, etc. The names in light type are those whose characteristics are possessed in an equal or superior degree by other varieties which appear in heavy type. Some varieties in light type equal others in heavy type having the same characteristics, but where there is a difference it is in favor of the varieties in heavy type. In cases of equal excellence, the best known has the preference. So that the varieties in heavy type as a whole, and without disparagement to other excellent sorts, may be said to embrace the leading kinds for general culture.

New, or comparatively unknown varieties also appear in light type; but for this distinction see "Adaptability" column.

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NOTE.—In referring to the time of ripening, in the column headed "Season", "very early" applies to varieties marketed in September and October; "early", to October and November varieties; "early medium", November and December; "medium", December, January and February; "late medium", February and March; "late", March and April; "very late", April, May and later.

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NOTE.—The region of orange production proper extends southward from Central Florida, overlapping the upper portion of Southern Florida. Therefore, under "Adaptability" below the varieties have been starred for "Southern Florida"; here, however, the starring applies more particularly to the upper portion of the district.

(See Explanation of Abbreviation, on page iii.)

| NAMES | Origin. | DESCRIPTION. Fruit. Use. | Size. | Form. | Color. | Quality. | Season. | Plant. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SWEET ORANGES — Citrus aurantium dulcis. | | | | | | | | | | | | | |
| 1 **Bessie** | St M | d | s | | o | g | l | | | — | — | * | ** |
| 2 Boone (Boone's Early) | Mal | d | s | r | lo | | ve | | | — | † | † | * |
| 3 Brazilian | St M | d | s | m | r | o | vg | l | g | g | — | — | * | * |
| 4 **Centennial** | St M | d | s | m | r | o | b | em | v | p | — | — | * | * |
| 5 Drake Star | St M | d | s | l | r | o | g | m | v | | — | — | * | * |
| 6 **Du Roi** | St M | d | s | m | r | o | g | lm | v | p | — | — | ** | * |
| 7 **Early Oblong** (St. Michael Egg) | Sev | d | s | m | e | o | f | ve | g | p | — | * | * | * |
| 8 **Enterprise Seedless** (Starke Seedless) | Sev | d | s | m | r | o | vg | e | g | vg | — | — | ** | ** |
| 9 Foster | St M | d | s | m | r | o | g | e | g | p | — | * | * | ** |
| 10 **Hart** (Tardiff, Brown, Excelsior) | St M | d | s | m | e | o | g | vl | v | p | — | — | ** | ** |
| 11 **Higley Late** | St M | d | s | m | r | o | g | l | v | p | — | — | ** | * |
| 12 **Homosassa** | Sev | d | s | m | r | o | vg | m | v | p | — | — | ** | * |
| 13 **Jaffa** | Mal | d | s | m | r | o | b | m | g | p | — | — | ** | * |
| 14 Lamb Summer | St M | d | s | | e | o | | vl | | | — | — | * | * |
| 15 Madam Vinous | St M | d | s | m | r | o | b | m | v | | — | — | ** | * |
| 16 Magnum Bonum | St M | d | s | l | r | o | vg | m | v | g | — | — | * | * |
| 17 **Majorca** | Mal | d | s | m | r | o | b | lm | v | p | — | — | ** | ** |
| 18 **Maltese Blood** | Mal | d | s | s | e | or | b | m | | | — | — | * | * |
| 19 **Maltese Oval** (Garey Med. Sweet) | Mal | d | s | l | e | o | vg | l | g | p | — | — | ** | ** |
| 20 Mays | St M | d | s | m | r | o | vg | m | g | g | — | — | * | * |
| 21 Mediterranean Sweet (Sanford's) | St M | d | s | l | e | o | vg | l | m | p | — | — | * | * |
| 22 **Nonpareil** | Sev | d | s | l | r | o | b | em | v | p | — | * | ** | * |
| 23 **Old Vini** (Beach No. 2) | Sev | d | s | m | r | o | vg | m | v | p | — | — | * | * |
| 24 **Paper Rind** | St M | d | s | s | e | lo | g | lm | g | vp | — | — | * | * |
| 25 **Parson Brown** | St M | d | s | m | e | o | g | e | v | p | — | * | ** | * |
| 26 **Pineapple** | St M | d | s | | | | vg | m | v | p | — | * | * | * |
| 27 **Ruby** (Sanguinea, DuRoi Blood) | Mal | d | s | m | r | or | vg | em | g | p | — | — | * | * |
| 28 **St. Michael Blood** | Mal | d | s | m | r | o | b | m | g | p | — | — | * | * |
| 29 Star Calyx | St M | d | s | l | r | o | g | m | g | g | — | — | * | * |
| 30 **Sweet Seville** (Sanford's Sweet Seville) | Sev | d | s | s | r | o | g | ve | v | p | — | * | * | * |
| 31 Tephi | Mal | d | s | m | r | o | vg | m | vp | p | — | * | * | * |
| 32 Valencia Late | Mal | d | s | l | e | lo | g | l | g | p | — | — | * | ** |
| 33 **Washington Navel** | Sev | d | s | l | re | o | b | em | g | s | — | * | * | * |

REMARKS—On varieties as numbered above: Nos. 8 and 25, desirable early sorts: 5, 23 and 28, distinct: 6, distinctly corrugated, desirable; 1 and 10, very desirable late sorts; 11, 12, 13, 17, 21 and 26, desirable; 6, 7 and 18 came from Thomas Rivers, of England, the well-known nurseryman.

OF SWEET ORANGES, the leading fruit crop of the State, and great staple of the Central region, over five million boxes were produced in the season of 1894-95.

THE NAVEL VARIETIES are much esteemed on account of the delicate texture and superior quality of their fruit. They are usually shy bearers, although experience indicates that they are much more prolific upon "rough" lemon and trifoliata stocks than, as generally grown, upon orange stocks.

THE BLOOD VARIETIES are sweet, and therefore marketable, early in season, as indicated by the abbreviations in the "Season" column. At this time their distinctive character is not apparent, and they have little advantage in market over other early sorts. As the season advances, their ruby tints develop, until quite apparent on the exterior, and their quality continues to improve until, at full ripeness, they are equaled by few and surpassed by none. In locations sufficiently exempt from frost to permit their being held on the trees until they reach perfection, they bring high prices and are exceptionally profitable.

OTHER VARIETIES.—Excluding the Navels, Bloods and Satsuma, noted above, and without disparagement to other sorts of equal merit, the following are suggested as a desirable list for general planting, arranged in order of succession: Very Early, Boone, Sweet Seville; Early, Enterprise Seedless, Parson Brown; Early Medium, Nonpareil, Centennial; Medium, Pineapple, Jaffa, Homosassa; Late Medium, Majorca, Du Roi; Late, Bessie, Maltese Oval; Very Late, Hart

Varieties distinctly marked in their exterior appearance, like the Navels, Bloods, Du Roi, etc., are, other things being equal, most desirable for market.

## MANDARIN ORANGES—Citrus nobilis.

(See Explanation of Abbreviations on page iv.)

| NAMES | Origin. | DESCRIPTION. Fruit. Use. | Size. | Form. | Color. | Quality. | Season. | Tree. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Cha (Mandarin) | For | d s | m | f | l o | g | e | g | f | — | — | * | * |
| 2 **Dancy** (Tangierine) | N | d s | ml | f | r | b | e m | g g | v p | — | — | ** | * |
| 3 **King** (King of Siam) | For | d s | l | f | o | v g | v l | g g | v p | — | — | * | * |
| 4 **Oneco** | N | d s | ml | f | o | v g | l m | g g | f | — | — | * | ** |
| 5 **Satsuma** (Oonshiu | For | d s | m | f | o | v g | v e | g | v p | — | * | ** | * |

REMARKS—No. 1, a favorite in the New Orleans market; No. 2, the favorite of the group. The Satsuma is valued on account of its hardiness, which is increased by being budded on the entirely hardy C. trifoliata. It is much planted in sections north of the usual range of oranges.

## BIGARADE ORANGES—Citrus vulgaris.

(See Explanation of Abbreviations on page iv.)

| NAMES | Origin. | DESCRIPTION. Fruit. Use. | Size. | Form. | Color. | Quality. | Season. | Tree. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Bitter Sweet | N | d c | l | r f | d o | | v l | v | p | — | — | * | * |
| 2 **Phillips Bitter Sweet** | N | d c | l | r f | d o | | v l | v | p | — | — | * | * |
| 3 **Sour** | N | c | l | r f | d o | | v l | v | p | — | — | ** | * |

REMARKS—Nos. 1 and 2, very refreshing in summer; 3, refreshing in summer and much used in making marmalades.

## POMELOS—(Grape Fruit) Citrus decumana.

(See Explanation of Abbreviations on page iv.)

| NAMES | Origin. | DESCRIPTION. Fruit. Use. | Size. | Form. | Color. | Quality. | Season. | Tree. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Aurantium | N | ds | m | r | ly | g | lm | v | vp | — | — | ** | * |
| 2 **Duncan** | N | ds | l | rf | ly | vg | l | v | vp | — | * | ** | * |
| 3 Hall | N | as | l | r | ly | g | l | v | vp | — | — | ** | ** |
| 4 **Indian River** (Standard) | N | ds | l | rf | ly | vg | vl | v | vp | — | — | ** | ** |
| 5 Josselyn | N | ds | m | r | lo | g | lm | v | vp | — | — | ** | * |
| 6 **Marsh** | N | ds | l | f | ly | vg | lm | v | vp | — | — | ** | * |
| 7 Mays | N | ds | l | rf | ly | vg | lm | v | vp | — | — | ** | * |
| 8 **Pernambuco** | F | ds | l | rf | ly | vg | vl | v | vp | — | — | ** | * |
| 9 Royal | N | ds | ml | rf | lo | g | lm | v | vp | — | — | ** | ** |

THE POMELO.—Growing the Pomelo for market is a development of the past fifteen or twenty years; but large quantities of this fruit are now shipped from the State and its culture is rapidly extending. It has proved popular in the general market and its culture is very profitable. Its range of adaptability is about the same as that of the orange. Most of the older trees were planted before named varieties were introduced. The above list comprises the leading varieties now generally planted.

## SHADDOCKS—Citrus decumana.

(See Explanation of Abbreviations on page iv.)

| NAMES | Origin. | DESCRIPTION. Plant. Use. | Size. | Form. | Color. | Quality. | Season. | Tree. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Blood Shaddock | F | | l | r | lo | f | | v | | — | — | ** | * |
| 3 Mammoth or Orange Shaddock | F | | l | r | lo | f | | v | | — | — | ** | * |

REMARKS—The Shaddocks are of no commercial importance in Florida, nor are they desirable except as ornamental fruits, remarkable for their size and beauty.

## LEMONS—Citrus limonum.

(See Explanation of Abbreviations on page iii.)

| NAMES (Varieties.) | Origin. | DESCRIPTION. Fruit. Use. | Size. | Form. | Color. | Quality. | Season. | Tree. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Belair | F | c s | m | bl | l y | b | f | v | v p | — | — | * | ** |
| 2 Genoa (Eureka) | F | c s | m | l | l y | b | f | v | v p | — | — | | ** |
| 3 Imperial (Messina) | | c s | m | l | y | g | f | v | v p | | | * | ** |
| 4 Sicily (Sanford's Thornless) | F | c s | m | l | l y | b | f | v | v p | — | — | * | ** |
| 5 Villafranca | F | c s | m | l | l y | b | f | v | v p | — | — | * | ** |

THE LEMON.—Lemon growing in Florida is an industry of some importance, the crop of 1894 being estimated at 150,000 boxes. The tree stands less cold than the orange, and planting is confined to lower latitudes and locations of comparative frost exemption. The foregoing varieties are highly esteemed and generally planted.

## MINOR CITRUS FRUITS.

(See Explanation of Abbreviations on page iii.)

| NAMES. | Origin. | DESCRIPTION. Fruit. Use. | Size. | Form. | Color. | Quality. | Season. | Tree or Plant. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KUMQUATS-Kin Kans (Citrus Japonica) | | | | | | | | | | | | | |
| 1 Marumi | F | d c s | s | r | o | | | m | p | — | — | ** | * |
| 2 Nagami | F | d c s | s | o | o | | | m | p | | * | ** | * |
| LIMES (Citrus Limetta.)* | | | | | | | | | | | | | |
| 3 Rangpur | F | c s | m | f | r | v g | f w | v | p | — | — | * | ** |
| 4 Tahiti | F | c s | l | l | y | v g | f | v | p | — | — | * | ** |
| CITRONS (Citrus Medica.) | | | | | | | | | | | | | |
| 5 Corsican | F | | | | | | | | | | | | |
| 6 BERGAMONTS (Citrus bergamium | | | | | | | | | | — | — | * | |
| 7 OTAHEITES (Citrus sinensis) | | | | | | | | | | — | — | * | |
| 8 TRIFOLIATAS (Citrus trifoliata | | | | | | | | | | * | * | * | |

REMARKS.—On varieties and species as numbered above: No. 6, grown as an ornamental, yields an essential oil; 7, grown as an ornamental, and as a stock for dwarfing—fruit valueless; 8, a hardy species, grown as ornamental, extensively used as stock and for hedges—fruit valueless.

*Most of the limes grown in the State are designated as Mexican limes. They are seedlings and should be referred to as the Mexican group. Lime culture is of considerable importance.

# DECIDUOUS FRUITS.

## PEACHES—Persica vulgaris.

NOTE.—The time of ripening of any particular variety varies considerably, in Florida, as elsewhere, according to season and locality. Under head of "Season," "very early" means April 20 to June 15; "early," from June 1 to July 15; "medium," from July 1 to August 10; "late," from August 1 to September 20; "very late," September 10 to November 1.

NOTE.—"Color," as applied to peaches, refers to the flesh, and not to the exterior, as with other fruits.

(See Explanation of Abbreviations, on page iv.)

| NAMES | Origin. | DESCRIPTION. Fruit. Use. | Size. | Class. | Color. | Quality. | Season. | Tree. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Angel | P-to | ds | l | f | w | b | e | v | vp | * | ** | ** | ** |
| 2 Belle of Georgia | NC | ds | l | f | w | g | m | g | p | ** | * | — | — |
| 3 Bidwells Early | P-to | ds | m | c | w | g | ve | g | p | — | * | ** | ** |
| 4 Bidwells Late | P-to | ds | l | c | w | g | e | v | vp | — | ** | ** | ** |
| 5 Cablers Indian | S | dcn | l | c | r | g | m | g | f | ** | * | * | — |
| 6 Carman | NC | ds | l | f | w | b | e | g | p | † | † | | |
| 7 Chinese Cling | NC | dn | l | c | w | g | m | g | f | * | — | — | — |
| 8 Climax | H | ds | m | f | w | g | e | g | p | * | * | * | — |
| 9 Colon | H | ds | m | f | wr | g | e | g | p | * | * | * | — |
| 10 Countess | S | dn | l | f | w | g | m | v | p | * | * | * | — |
| 11 Crawfords Early | Per | dn | l | f | y | b | e | g | f | * | — | — | — |
| 12 Dorothy (Dorothy N.) | P-to | ds | ml | f | y | g | m | | p | | ** | ** | * |
| 13 Elberta | NC | a | vl | f | y | g | m | g | p | ** | — | — | — |
| 14 Estella | S | ds | l | f | y | g | l | g | f | ** | * | | — |
| 15 Florida Crawford | S | dcn | l | f | y | b | m | g | f | * | * | * | |
| 16 Florida Gem | H | a | m | f | wr | vg | e | g | p | ** | ** | ** | * |
| 17 General Lee | NC | a | l | c | w | g | m | g | f | ** | * | — | — |
| 18 Gibbons October | S | dn | m | f | w | g | vl | g | f | * | * | * | — |
| 19 Greenboro | Per | ds | m | f | w | g | e | g | f | † | † | | |
| 20 Hall (Hall's Yellow) Early | | | ml | f | y | | e | | | | ** | * | * |
| 21 Honey | H | a | m | f | w | g | e | g | vp | * | ** | * | * |
| 22 Imperial | H | a | l | f | w | vg | ve | g | p | ** | ** | * | — |
| 23 Japan Dwarf Blood | NOB | ds | m | f | r | f | ve | m | f | * | * | — | * |
| 24 Jewel | P-to | ds | m | f | w | g | ve | g | g | * | ** | ** | * |
| 25 La Magnifique | S | dcn | l | c | w | g | l | g | g | * | * | — | — |
| 26 La Reine | S | dcn | l | c | w | g | m | g | g | * | * | — | — |
| 27 Maggie | P-to | ds | m | c | w | g | ve | g | f | — | — | ** | ** |
| 28 Mamie Ross | NC | ds | l | c | w | g | e | g | g | † | * | — | — |
| 29 Onderdonk | S | dcn | m | f | y | g | m | g | f | * | * | — | — |
| 30 Oviedo | H | a | m | f | w | g | e | g | f | * | * | ** | * |
| 31 Pallas | H | ds | m | f | w | g | e | m | f | * | * | | |
| 32 Peen-to | P-to | a | m | c | w | g | ve | v | vp | — | — | * | ** |
| 33 Powers September | S | dn | m | f | w | g | vl | g | f | * | * | — | — |
| 34 Red Ceylon | NOB | c | m | c | r | f | ve | m | p | — | — | * | * |
| 35 Sneed | NC | ds | m | c | w | g | ve | g | p | ** | * | — | — |
| 36 Stanley | H | ds | m | c | w | g | e | v | p | * | ** | * | |

## PEACHES—Continued.

(See Explanation of Abbreviations on page iii)

| NAMES | Origin. | DESCRIPTION. Fruit. Use. | Size. | Class. | Color. | Quality. | Season. | Tree. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 37 Suber | P-to | d s | m | c | w | g | v e | v | p | — | — | * | ** |
| 38 Taber | H | d s | m | c | w r | b | e | g | g | ** | ** | * | * |
| 39 Triana | H | d s | m | f | w r | g | e | g | p | * | * | * | — |
| 40 Victor | | | m l | c | w | g | v e | | p | * | * | | |
| 41 Victoria | S | d c n | l | f | y | g | l | g | g | * | * | * | — |
| 40 Waldo | P-to | d s | m | f | w | g | v e | v p | g | * | ** | ** | ** |
| 43 Yum Yum | P-to | d s | m | c | w | g | v e | g | g | — | — | * | ** |

REMARKS.—The Peach is successfully grown in localities throughout the greater part of the State, and in some districts is extensively produced for shipment to Northern markets. As a rule, for this purpose, only those varieties are grown which are marked "early" and "very early" in the above table, and which come in before the general crop farther north. To this there are some exceptions, notably in Western North Florida, where some mid-season varieties, like Elberta, are successfully grown for shipment.

While the list of peaches grown in the State embraces many varieties, the various sections, covering a wide range of latitude and longitude, differ to such an extent in soil, climate and conditions of local environment, that the varieties adapted to a particular region are comparatively limited in number. A first and vital essential to successful peach production is the adaptability of variety to locality; in general this is true of peaches to a greater extent than other fruits, and especially so in Florida.

No. 21 is of peculiar shape, being elongated, with deep suture, and sharp recurved point. It is very sweet as its name "Honey" indicates: This variety comes from China and is the progenitor of a race of peaches well suited to the central and northern sections of the State. No. 38, the Peen-to, is also possessed of marked individual characteristics; its shape being flat like a tomato, and unless grown with fertilizers rich in phosphoric acid and potash is apt to be possessed of a bitter almond or noyau flavor. It comes from Southern China or Java and the varieties that have originated from it have given us a sub-tropical race of peaches well adapted to Southern and Central Florida. It is safe to say that nine-tenths of the commercial peach culture of peninsular Florida is confined to the varieties that have been originated from the above two introductions from the Orient. It should be mentioned, however, that neither the varieties that have originated from the Honey or from the Peen-to retain to such a marked extent the shape of the parent. Those that have originated from the Honey show a tendency to the recurved point but in a less marked degree. Those that have originated from the Peen-to are of regular peach shape.

## PLUMS—Prunus triflora and hybrids.

NOTE.—"J," as used in "Origin" column, means that the variety belongs to the Japanese class (P. Triflora) but not necessarily imported from Japan.

(See Explanation of Abbreviations on page iv.)

| NAMES | Origin. | DESCRIPTION. Fruit. Use. | Size. | Form. | Color. | Class. | Quality. | Season. | Tree. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Abundance | J | a | l m | | y r | c | g | e m | v | f | * | * | — | — |
| 2 Burbank | J | a | l m | | p y | c | g | e m | v | g | ** | * | — | — |
| 3 Chabot | J | a | l m | | r p | c | g | m | v | r | * | * | — | — |
| 4 **Excelsior** | J H | a | m | | r p | c | b | v e | v p | f | ** | ** | ** | * |
| 5 Howe | J H | a | l m | rb | r | c | g | m | v | f | * | * | — | — |
| 6 Kelsey | J | a | v l | | g y | f | g | l | v | f | * | * | — | — |
| 7 Red June | J | a | m | | r | c | g | v e | v | f | * | * | — | — |
| 8 Satsuma | J | a | l | | p | e | b | m l | v | f | * | * | — | — |
| 9 Wickson | J | a | l | | b r | c | b | m | v | f | * | * | † | — |

## PEARS—Pyrus communis.

(See Explanation of Abbreviations on page iv.)

| NAMES | Class. | DESCRIPTION. Fruit. Use. | Size. | Form. | Color. | Quality. | Season. | Tree. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Keiffer | O | a | l | rbp | y&r | g | v l | v | f | ** | ** | ** | — |
| 2 Le Conte | O | a | l | olbp | y g | g | e | v | v p | ** | ** | * | — |
| 3 Smith | O | a | l | e p | y g | | e | v | p | ** | ** | * | * |

## GRAPES—Vitis—Labrusca, Æstivalis, Vulpina.

(For Explanation of Abbreviations see Page iv.)

| NAMES (Varieties.) | Origin. | DESCRIPTION. | | | | | | | | | | Adaptability. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | FRUIT. | | | | | | | | VINE. | | | | | |
| | | | BUNCH. | | BERRY. | | | | | | | | | | |
| | | Use. | Size. | Form. | Size. | Form. | Color. | Quality. | Season. | Vigor. | Prolificness. | Western North Fla | Eastern North Fla | Central Florida. | Southern Florida. |
| 1 Concord..... | L | dnw | l | sh | l | r | b | g | m | g | f | * | * | * | |
| 2 Cynthiana..... | A | dw | m | shcp | s | r | b | vg | l | v | f | ** | ** | ** | |
| 3 Delaware..... | H? | a | s | shcp | s | r | r | b | m | g | p | * | | * | |
| 4 Diamond..... | L | ds | m | shcp | m | r | w | g | ve | v | p | — | * | * | — |
| 5 Elvira..... | RH | w | s | cp | m | r | w | g | m | g | p | * | * | * | — |
| 6 Goethe..... | H | dn | m | | vl | e | w | vg | l | v | p | | * | * | |
| 7 Herbemont..... | A | dw | m | shcp | s | r | b | vg | l | v | p | — | * | * | * |
| 8 Ives..... | L | sw | m | cp | m | re | b | f | ve | v | p | ** | * | * | |
| 9 Key..... | | | | | | | | | | | • | | | | * |
| 10 Niagara..... | L | ds | l | cp | m | r | w | g | ve | v | p | — | ** | ** | * |
| 11 Norton..... | A | dw | m | shcp | s | r | b | g | l | v | f | ** | ** | ** | — |
| 12 Salem..... | H | dn | m | shcp | l | r | r | vg | m | v | f | — | * | * | — |
| 13 Lindley..... | H | ds | l | shcp | l | v | v | vg | e | v | v p | | ** | ** | |
| 14 Wilder..... | H | dn | l | br | vl | r | b | vg | m | v | f | | * | * | |

REMARKS.—2, 9, 11, almost free from fungous diseases: 1, 3, 4, 5, 10; 13, subject to fungous diseases in wet seasons; 7, 12, 14, subject to fungous diseases: 7, stars apply especially to the East Coast.

GRAPES.—In many locations throughout the State varieties (as indicated by the starring above) succeed well, and are grown for shipment to Northern markets as well as for local consumption and the manufacture of wine.

FOR MARKET.—Delaware, Niagara, and Ives (only) have proved a success as shipping grapes for distant markets (when properly packed). Diamond, on account of its compactness and tendency to crack, does not stand long shipment.

FOR RED WINE.—Cynthiana, Norton and Ives are the red-wine grapes of Florida, as they are the red-wine grapes of the United States. Especially is this true of the first two named; their juice is dark and rich in saccharine matter, and the wine made from these two grapes is said to possess great medicinal properties, owing to its large percentage of tannin.

FOR WHITE WINE.—Elvira, Delaware and Niagara are, among the varieties above named, the best grapes for white wine—especially dry wine. It is from Elvira that the famous San Luis Sauternes are made, which have established the reputation of Florida wines. Delaware is better adapted to the manufacture of sweet wine, and from Niagara a good dry wine can be made—much superior to the article made from Northern grown Niagaras, our Florida Niagaras being almost entirely free from that foxy taste so prominent in all Northern Labruscas.

EUROPEAN VARIETIES (V vinifera.)—The U. S. Department of Agriculture, Division of Pomology, has established an experimental vineyard of European varieties, about 550 vines of 175 varieties

at Earleton, under the charge of Baron H. von Luttichau. They are all grafted on V. riparia and V. rupestris, are now in their fifth year and so far are remarkably successful.

OTHER VARIETIES.—Besides the varieties described in the list above, other varieties may do well in particular localities or favored locations, and may be satisfactorily grown for family use, but varieties not included in this Catalogue should not be attempted on a large scale until their value has been demonstrated by experiment.

## MUSCADINE GRAPES.—Vitis rotundifolia.

(For Explanation of Abbreviations see page iv)

| NAMES (Varieties) | Origin. | DESCRIPTION. | | | | | | | | | | Adaptability. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Fruit. | | | | | | | | | Vines. | | | | |
| | | | Bunch. | | Berry. | | | | | | | | | | |
| | | Use. | Size. | Form. | Size. | Form. | Color. | Quality. | Season. | Vigor. | Prolificness. | Western North Fla | Eastern North Fla. | Central Florida. | Southern Florida. |
| 1 Eden..... | v | dnw | s | r | v l | r | b | g | v l | v | v p | ** | ** | ** | ** |
| 2 Flowers..... | v | dnw | s | r | v l | r | b | f | v l | v | p | ** | ** | ** | * |
| 3 James..... | v | dnw | s | r | v l | r | b | v g | v l | v | v p | ** | ** | ** | ** |
| 4 Meisch..... | v | dnw | s | r | v l | r | p | g | v l | v | p | ** | ** | ** | ** |
| 5 Scuppernong.. | v | dnw | s | r | v l | r | vzy | v g | v l | v | v p | ** | ** | ** | ** |
| 6 Thomas..... | v | dnw | s | r | v l | r | b | v g | v l | v | v p | ** | ** | ** | ** |

REMARKS—The Muscadine Grapes are prodigious growers and bear heavy crops of fruit. They are very popular in the South, where they are used for dessert and for making wine and jelly, but they are not grown for Northern market.

## KAKI—Japanese Persimmon—Diospyros Kaki.

| NAMES. | Origin. | DESCRIPTION. | | | | | | | | Adaptab'lity. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | FRUIT. | | | | | | TREE. | | | | | |
| | | Use. | Size. | Form. | Color. | Quality. | Season. | Vigor. | Prolificness. | Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
| 1 Costata | J | d s | m | rcpt | s r | g | l | v | p | ** | ** | ** | * |
| 2 Hachiya | J | d s | v l | obpt | b r | v g | e | g | s | * | * | * | * |
| 3 Haykume | J | d s | l | rfob | o r | g | m | v | p | ** | ** | ** | * |
| 4 Okame | J | d s | l | r f g | b c r | g | &me | v | v p | ** | ** | ** | * |
| 5 Tabers No. 129 | J | d s | m | rpt | o r | rfob | v e | v | p | ** | ** | ** | * |
| 6 Tanenashi | J | d s | l | rcpt | l r | b | m | g | g | ** | ** | ** | * |
| 7 Triumph | | | | | | | | | | | | | |
| 8 Tsuru | J | d s | l | olpt | b r | g | v l | v | v p | ** | ** | ** | * |
| 9 Yeddoichi | J | d s | m | r f | d r | v g | m | g | g | ** | ** | ** | * |
| 10 Yemon | J | d s | l | r f g | o&r | v g | m | v | p | ** | ** | ** | * |
| 11 Zengi | J | d s | s | r f | d r | g | v e | v | v p | ** | * | * | * |

The Kaki succeeds well throughout the State, and is generally, though not extensively, grown. For market this delicious fruit has the merit of shipping well and keeping long. While new markets are often reluctant to take hold of it, wherever known it sells well.

Nomenclature.—While there has been much confusion in regard to the names of varieties, the above kinds are now as well known as the leading varieties of other fruit; they embrace the most valuable kinds, and the names as given are correctly applied.

Characteristics.—Some of the varieties have dark flesh, others light flesh, still others a mixture of the two. The light and dark flesh differ radically in texture and consistency as well as appearance, and when found in the same fruit are never blended, but always distinct. The dark flesh is never astringent; the light flesh is astringent until it softens. The dark-fleshed fruit is crisp and meaty, like an apple, and is edible before it matures. Some of the entirely dark-fleshed kinds improve as they soften, like Hyakume and Yeddoichi; others are best when still hard, like Zengi and Tabers No. 129. As they are good to eat before they are ripe, it is not so important that the dark-fleshed kinds be allowed to reach a certain stage before being offered to consumers unfamiliar with the fruit. The light-fleshed kinds, and those with mixed light and dark flesh, are very delicious when they reach the custard-like consistency of full ripeness. In some the stringency disappears as the fruit begins to soften, as the Yemon, and in a less degree with Okame and Tanenashi; in others it persists until the fruit is full ripe, as with Tsuru. The light-fleshed kinds should not be offered to consumers unacquainted with the fruit until in condition to be eaten. A person who has attempted to eat one of them when green and "puckery" will not be quick to repeat the experiment. Seeds accompany the dark flesh. The light-fleshed kinds are seedless. The kind with mixed flesh have seeds in proportion to the quantity of dark flesh. Hyakume, Zengi and Hachiya are usually overspread at the blossom end with pencilling or net-work of dark lines, and this sometimes occurs in other kinds.

Varieties.—Tanenashi, Okame, Yemon and Yeddoichi excel in quality, perhaps in the order named. Okame (on account of the difficulty of getting the fruits all in the same stage of ripeness) and Hachya are not as good shippers as the others; the latter is valued for its immense size and showiness. Okame, on account of its long season, exquisite beauty, and superior quality, is the best for home use and local market. Zengi and Tabers No. 129 are valued for their earliness, as are Tsuru and Costata for their lateness. Costata is very distinct and handsome in both tree and fruit. Hyakume is most generally grown of the dark-fleshed kinds. Tanenashi is, perhaps, most highly esteemed in the market.

Stock.—The Kaki should be grafted on the native persimmon, on which it is much more satisfactory than upon its own or imported stocks.

## MINOR DECIDUOUS FRUITS.

(See Explanation of Abbreviations on page iv.)

| NAMES | Origin. | DESCRIPTION. Fruit. Use. | Size. | Form. | Color. | Quality. | Season. | Tree or Plant. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| APPLES—Pyrus malus | | | | | | | | | | | | | |
| 1 Jennings | N? | d n | l | f | g | g | e | v | p | * | * | † | — |
| 2 Red Astrachan | F | d n | l | r | r | g | e | | | * | | | |
| FIGS—Ficus carica. | | | | | | | | | | | | | |
| 3 Black Ischia | F | d e n | m | | b | g | s | | | | * | * | * |
| 4 Blue Genoa | F | d e n | m | | b l | g | s | m | | | * | * | * |
| 5 Brown Turkey | F | d e n | m | | b r | b | s | m | g | | * | * | * |
| 6 **Brunswick** | F | d e n | l | | v b r | g | s | v | v p | | * | * | * |
| 7 **Celestial** | F | d e n | s | | p v | b | s | v | v p | * | * | * | * |
| 8 Green Ischia | F | d e n | m | | g | g | s | v | | | * | * | * |
| 9 Lemon | F | d e n | m | | y | g | s | v | v p | | * | * | * |
| 10 **White Adriatic** | | | | | | | | | | | | | |
| MULBERRIES—Morus nigra | | | | | | | | | | | | | |
| 11 Downing | A | | m | o l | b | g | E | v | s | * | * | * | |
| 12 Hicks | A | | m | o l | b | f | E & L | v | v p | * | * | * | * |
| 13 Stubbs | A | | l | o l | b | g | M | v | p | * | * | * | * |
| POMEGRANATES—Punica granatum | | | | | | | | | | | | | * |
| 14 Acid | | d | l | r | r y | | F | v | p | * | * | * | * |
| 15 Purple | | d | l | r | r y | b | F | v | p | * | * | * | * |
| 16 Sweet | | d | l | r | r y | g | F | v | p | * | * | * | * |

REMARKS.—Nos. 1 and 2, home use; 12, unsatisfactory bearer; 13, enormously productive; 14 and 15, superior quality acid; 16, most desirable.

APPLES AND APRICOTS—Are not recommended for general culture, although the varieties named give fair results in the home orchard in the regions indicated.

THE FIG—A most delicious fruit for the table and culinary use, thrives everywhere. It is not grown for shipment, except when canned or preserved, in which form it finds a ready market at high prices, but is one of the most valuable and generally grown home-use-and-local-market fruits. All the varieties named are desirable.

MULBERRIES—Are well adapted to all sections. They are largely grown for swine, poultry, and as a toll for birds; and, by some, the more acid kinds are esteemed for table use.

THE POMEGRANATE—An agreeable fruit, desirable for occasional use, and especially valuable as an ornamental shrub or tree, is not generally grown for market, but most plantations have a few trees There are several new choice varieties being tried.

## MINOR MISCELLANEOUS FRUITS.

(See Explanation of Abbreviations on page iv.)

| NAMES | Origin. | DESCRIPTION. Fruit. Use. | Size. | Class. | Color. | Quality. | Season. | Plant. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BLACKBERRIES—Rubus cuneifolius... | A | d n | | | | | | | | * | * | | * |
| DEWBERRIES—Rubus trivialis..... | A | d n | | | | | | | | * * | * * | * | * |
| LOQUATS—Eriobotrya Japonica.... .. | F | d n | m | e | y | v g | Sp | v | p | * * | * * | ** | * |
| OLIVES—Olea Europea ..... | F | c s | s | e | r b | | F | v | p | * | * | * | |

DEWBERRIES, also BLACKBERRIES in some varieties succeed admirably in the regions indicated, but are not cultivated to any considerable extent, owing to the abundance of native, wild berries. The Manatee Dewberry, and the Northey, presumably a hybrid, have proved satisfactory in many localities.

LOQUATS—Are grown in a small way for home consumption. They are a desirable fruit for table, as well as culinary use. At present the Loquat is propagated largely from seed, and the fruit varies greatly in size and quality. A number of varieties have been introduced from California and are being tested.

OLIVES.—Many trees have been planted, and there are some old groves. The varieties, of which there are many, are not sufficiently known in this State to catalogue.

# TROPICAL FRUITS.

## PINEAPPLES—Ananas sativa.

(See explanation of Abbreviations on page iv.)

| NAMES. | Origin. | DESCRIPTION. Fruit. Use. | Size. | Form. | Color. | Quality. | Season. | Tree or Plant. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Abachi.... ..... ..... | F | a | l | o l | o y | b | m | m | v | | | ** | * |
| 2 Egyptian..... ..... | F | a | m | y | g | m | e | g | p | | | | ** |
| 3 Porto Rico.... ..... ..... | F | a | v l | o y | g | m | e | g | f | | | * | ** |
| 4 Pernambuco.... ..... .... .. | F | d n | s | d y | v | v s | m | g | v p | | | | |
| 5 Spanish..... ..... ..... | F | a | m | r g | g | f | e | v | p | | | | ** |
| 6 Cayenne..... .... | F | a | l | o y | v g | f | m | g | p | | | ** | ** |

REMARKS.—All varieties of pineapples are adapted to South Florida with light protection, though three-fourths of the acreage is unprotected and escapes in ordinary winters without material damage

from cold. In South Central Florida they require artificial heat to protect them from frost during the winter. Further North they cannot be successfully grown except under glass.

The Spanish, Porto Rico, and Cayenne are grown most extensively for market. The Egyptian Queen, and Pernambuco are grown for market less extensively. These remarks apply to the East Coast.

In the numerous and expensive shedded pineries of Orange County and the West Coast, which are cultivated on an intensive system, the Cayenne is planted almost exclusively.

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## BANANAS—Musa.

(See Explanation of Abbreviation on page iv.)

| NAMES, (Varieties.) | Origin. | DESCRIPTION. Fruit. Use. | Size. | Form. | Color. | Quality. | Season. | Tree. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Baracoa (Red Jamaica) .... . | WI | ds | l | | r | g | | v | p | — | — | — | ** |
| 2 Cavendish.... ..... ..... ... | EI | ds | m | | y | b | | v | p | — | — | — | ** |
| 3 Dacca..... ..... ..... . | | dn | m | | y | g | | v | p | — | — | — | ** |
| 4 Golden (Tahiti?).. .... .... ... | WI | dn | l | | y | g | | v | p | — | — | — | ** |
| 5 Harts Choice..... ..... ..... | WI | dn | s | | y | b | | v | p | — | — | * | ** |
| 7 Orinoco ("Horse Banana").... . | S A | dcn | l | | y | f | | v | p | — | — | * | ** |

REMARKS—On varieties as numbered above. Nos. 1, 2 and 4, general market; 3, 5 and 7, home use.

COMMERCIAL BANANA CULTURE is confined to the extreme lower portion of the peninsula.

VARIETIES.—The Baracoa is the ordinary Red Banana of commerce The Cavendish (M. Cavendishii) is a dwarf species, also known as "Dwarf," "Dwarf Jamaica," "Chinese." Except the Orinoco, Hart's Choice has a more northern range than the other sorts. The Orinoco matures further north than any other variety, it is an ordinary plantain (M. paradisaica sapientum) as distinguished from the Banana or Sweet Plantain (of which Baracoa and Golden are varieties); when allowed to ripen on the plant, it is of good quality, and desirable for home use, in sections too far north for other kinds.

## GUAVAS—Psidium.

(See Explanation of Abbreviations on page iv.)

| NAMES. | Origin. | DESCRIPTION. Fruit. Use. | Size. | Form. | Color. | Quality. | Season. | Tree. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Group of Common Guava (P. Guaiava) many unnamed varieties.... .... ..... ..... | W I | d c n | | | | | s & f | v | v p | — | — | * | ** |
| 2 Cattley (P. Cattleyanum).... . | A | c n | s | r | r | g | s & f | v | p | | * | ** | ** |
| 3 Chinese (P. Lucidum).... ..... | | c n | s | r | y | g | s & f | v | p | | * | ** | ** |
| 4 Guinea (P. Guineense)..... . | | d c n | l | p | y | g | s & f | v | p | | | ** | ** |
| 5 Guisaro (P. Molle).. .... .... | | c n | m | r | y | g | s & f | v | p | | | ** | ** |

REMARKS.—On varieties as numbered above. 2 and 3 hardy; No. 5 quite acid.

THE GUAVA is extensively grown in Central and Southern Florida for home use, local market, and the manufacture of jelly. It is a most delicious fruit for dessert, as well as cooking and preserving. There are numerous varieties, as yet unclassified. The hardy kinds, Cattley and Chinese, have about the same range as oranges.

## MANGOES—Mangifera Indica.

(See Explanation of Abbreviations on page iv.)

| NAMES | Origin. | DESCRIPTION. Fruit. Use. | Size. | Form. | Color. | Quality. | Season. | Plant. Vigor. | Prolificness. | Adaptability. Western North Fla | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Mulgoba..... .... ..... . | E I | d c n | l | k | y&r | b | s | v | v p | | | * | ** |

Remarks.—A large number of seedling mangoes are grown. Many of these are referred to as No. 11, and, while they have a group resemblance to one another, still they are distinct in varietal characteristics. A considerable number of named varieties are now being tested. Among these may be mentioned, Alfonse, Soondershaw, and Gordon.

## MINOR TROPICAL FRUITS.

| NAMES. | Origin. | DESCRIPTION. Fruit. Use. | Size. | Form. | Color. | Quality. | Season. | Tree. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Akee (Cupania sapida).. .... .... | Af | c | - | r | r | g | s | v | p | — | — | — | * |
| 2 Avocado (Persea gratissima).. .. | W I | dcs | l | p | y g p | g | s & f | v | p | — | — | — | ** |
| 3 Barbadoes Cherry (Malpighia glaba).... .... ..... ..... | Bar | dc | s | r | y | g | s | v | p | — | — | — | * |
| 4 Carissa arduina.... ..... .... .. | Natal | dc | m | ob | r | g | s | v | p | — | — | — | ** |
| 5 Cashew (anacardium occidentale) | S A | c | m | ob | y & r | g | s | v | p | — | — | * | ** |
| 6 Ceriman (Mostera deliciosa).... .. | J A | d | l | ob | yg | vg | s | v | p | — | — | — | ** |
| 7 Cherimoya (Anon cherimolia) .... | S A | dn | l | e | bry | g | s | v | p | — | — | — | ** |
| 8 Custard Apple (Anona reticulata) | W I | dn | l | c | g | g | s | v | p | — | — | * | * |
| 9 Downy myrtle(Myrtus tomentosus) | I | | s | ob | pr | g | s | v | | | | * | ** |
| 10 Egg-fruit (Lucuma rivicoa)..... | C | d | m | cg | y | f | s | v | p | — | — | — | ** |
| 11 Granadilla (Passiflora edulis)..... | V I | dc | m | r | g | g | s | v | p | — | — | — | * |
| 12. Granodilla (Passiflora quadrangularis) ..... ..... | C A | dc | l | ov | g | g | s | v | p | — | — | — | * |
| 13 Indian Fig Cactus (Opuntia ficus-Indica)..... .... .... ..... | I | c | l | ov | r | g | s | v | p | — | * | * | * |
| 14. Jamaica Sorrel (Hibiscus sabdipiffa)..... ..... ..... .... | M | c | l | ov | r | f | s | v | p | — | — | * | * |
| 15 Kei Apple (Aberia Caffa).... .... | A | c | | | | | | | | — | — | | * |
| 16 Limeberry (Triphrasia aurantiola) | P | c | s | ov | r | f | f | v | p | — | — | — | ** |
| 17 Mammee Apple (Mammea Americana)..... ..... ..... .... | W I | ds | l | r | br | g | s | v | p | — | — | — | * |
| 18 Mammee Sapota (Lucuma mammosa)..... ..... ..... .... | W I | ds | l | e | y | g | s | | | — | — | — | * |
| 19 Otaheite Gooseberry (Gicca disticha)..... ..... ..... .... | W I | c | s | r | w | g | | v | p | — | — | — | ** |
| 20 Pawpaw (Carica papaya).... .... | E&W I | dcn | l | e | y | f | ev | v | p | — | — | — | ** |
| 21 Rose Apple (Eugenia Jambos).... | E I | dc | m | r | lv | f | sp&s | v | p | — | — | — | ** |
| 22 Sapodilla (Achras sapota).... .. | W I | ds | m | r | br | g | ev | v | p | — | — | — | ** |
| 23 Sapota blanco (Casimiroa edulis).. | M | ds | m | | | | | | | — | — | — | * |
| 24 Sour Sop (Anon muricata).... .... | W I | c | l | c | g | g | s | v | p | — | — | — | * |
| 25 Spanish Lime (Melicocca biguga).. | W I | d | s | r | g | g | s | v | p | — | — | — | * |
| 26 Star Apple (Chrysophyllum cainito) | W I | d | m | r | g | g | sp | v | p | — | — | — | ** |
| 27 Sugar Apple (Anona squamosa).... | W I | dc | m | c | g | g | s&f | v | p | — | — | — | ** |
| 28 Surinam cherry (Eugenia michelia) | E I | dc | s | r | rb | g | s | v | p | — | — | * | ** |
| 29 Tamarind (Tamarindus Indicus).. | E I | ds | sm | pod | br | f | ev | v | p | — | — | — | ** |

## NUTS.

(See Explanation of Abbreviations on page iv.)

| NAMES. | Origin. | DESCRIPTION. Fruit. Use. | Size. | Quality. | Tree. Vigor. | Prolificness. | Adaptability. Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
|---|---|---|---|---|---|---|---|---|---|---|
| CHESTNUTS—Castanea | | | | | | | | | | |
| 1 Chinquapin (C. pumila) | A | dn | s | v g | v | p | * | * | | |
| 2 Japan Chestnut (G. Japonica) | F | d c s | vl | g | v | g | * | * | * | |
| PECANS—Carya olivæformis. | | | | | | | | | | |
| 3 Centennial | La | d s | l | b | v | p | ** | ** | * | |
| 4 Frotscher | La | d s | l | b | v | p | ** | ** | ** | |
| 5 Schley | Miss | d s | l | b | v | p | ** | ** | * | — |
| 6 Stuart | Miss | d s | l | b | v | p | ** | ** | ** | |
| 7 Van Deman | La | d s | l | b | v | p | ** | ** | * | — |
| WALNUTS—Juglans. | | | | | | | | | | |
| 8 Japan Walnut (J. Seiboldiana; J. cordiformis) | F | d | m | b | v | p | † | † | † | † |
| COCOANUTS. | | | | | | | | | | |
| 9 Seedlings | F | d c s | l | | v | p | — | — | — | ** |

Nuts.—The pecan has long been grown in the State in a small way; it flourishes in many localities and its culture is profitable. In addition to the four varieties above listed, other good varieties as yet only of local repute, will undoubtedly become prominent in the near future. The Japan chestnut, of comparatively recent introduction, has proved fairly well adapted, but hardly worthy of extensive commercial culture. The Japan walnut, of still more recent introduction, bears well and makes a remarkably handsome tree, but is not up to the standard of the best English walnuts in quality.

Extensive Cocoanut plantations are to be found on the southern coast. Little or no attention has been paid to varieties.

# MISCELLANEOUS FRUITS.

## STRAWBERRIES—(Fragaria.)

(See Explanation of Abbreviations on page iv.)

| NAMES (Varieties.) | Origin. | DESCRIPTION. | | | | | | | | | | Adaptability. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | FRUIT. | | | | | | | | PLANT. | | | | | |
| | | Sex. | Use. | Size. | Form. | Color. | Quality. | Flesh. | Season. | Vigor. | Productiveness. | Western North Fla. | Eastern North Fla. | Central Florida. | Southern Florida. |
| 1 Brandywine.... | A | B | dn | l | c | c | f | f | l | m | f | | ** | | * |
| 2 Cloud..... | A | P | a | l | bo | dc | f | m | el | v | p | ** | ** | * | |
| 3 Clyde..... .... | A | B | a | l | c | c | b | f | el | v | p | ** | ** | ** | |
| 4 Excelsior..... | A | B | a | m | ol | dc | g | m | ve | m | p | * | * | ** | ** |
| 5 Hoffman.... .... | A | B | s | m | c | dc | f | f | ve | m | f | | * | | * |
| 6 Klondike..... | A | | a | l | | dc | g | f | e | v | p | * | * | * | * |
| 7 Michel ..... | A | B | dn | l | bc | yr | v | s | ve | v | p | | * | * | * |
| 8 Murray..... | A | P | a | | o | dc | m | f | ve | v | vp | ** | ** | | ** |
| 9 Newnan..... | A | B | a | m | o | c | g | f | el | v | f | | ** | | |
| 10 Nick Ohmer..... | A | P | n | l | c | dc | b | m | l | v | p | | ** | | — |
| 11 Phenomenal.. .. | F | B | a | l | c | dc | b | r | el | v | p | | * | | ** |
| 12 Rising..... .... | A | P | a | m | ol | dc | m | f | ve | v | vp | | ** | | |
| 13 Thompson.... .. | A | B | s | l | o | sc | f | f | e | m | p | ** | ** | ** | ** |

REMARKS.—Since 1895 strawberry culture has been largely extended, especially on the Western slope of the peninsula. The Newnan has been allowed to degenerate and the fruit is now rather small for shipment. The Hoffman does better on clay than on sandy lands and needs high fertilizing. The Cloud is vigorous in North Florida and stands drouth well; prolific early in the season. Not liked so well in South Florida. Rising is very vigorous and prolific, a firm berry and an excellent shipper. Its foliage, however, grows rather open and it does not protect its fruit well against a frost The Phenomenal seems to be almost identical with the Hoffman in physical characteristics, but it has a longer season in South Florida. In Bradford county Aroma and Middleton's Early have been tested by individuals and reported on favorably. Glen Mary, Hood River, Dollar, Warfield, Star, Robbins Early, Splendid, Pride of Cumberland and Gandy have been tested and condemned. Klondike is a recent introduction of great promise, and has been given a place in the list of desirable varieties.

# FLORIDA STATE HORTICULTURAL SOCIETY.

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